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Determination of Harmful Quantities and Rates of Penalty for Hazardous Substances. Volume III. Appendices

Battelle-Northwest, Richland, Wash Pacific Northwest Lab

Prepared for

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APPENDIX A

INPUT DATA FOR DESIGNATED HAZARDOUS SUBSTANCES

The following appendix includes a brief profile of the physical/chemical and toxicological data employed to calculate harmful quantities and rates of penalty for each designated hazardous substance. A more detailed discussion on each designated substance and a complete accounting of available toxicological data can be found in the technical document accompanying the designation regulation. The profiles included here are drawn from that data base.

The data points employed are self-explanatory for the most part. The segment on shipping forms was included to indicate when substances are typically shipped or handled in other than pure forms. For these materials, harmful quantities and rates of penalty are subject to adjustment to compensate for the actual strength of the solution. The mammalian toxicity segment refers to median lethal dose (LD_{50}) data unless otherwise specified.

Critical concentrations in fresh and salt water have been calculated for all substances. In most cases, the data were derived directly from bioassay work on the material of interest. Lacking this information, extrapolations from related compounds were employed. In either case, the source of the critical concentration and original data reference are given as guidelines to understanding the ultimate levels selected.

Data collection on the toxicological properties of designated substances proved a difficult task. Information is scattered and lacks standardization. This is particularly true with respect to toxicity to marine organisms. Consequently, many of the salt-water toxicity levels were derived on the basis of freshwater data. Many freshwater critical concentrations for salts were extrapolated from data on single ions. When this was done, the more toxic ion was used as the basis of extrapolation. All molecular weights were taken as those for the salt form whose formula is given at the top of the profile. Whenever direct data was available, it was used in preference to extrapolated data unless the test conditions were significantly different than those specified in Chapter III of Volume II. When materials are characterized by decomposition in water, critical concentrations were based on the mare toxic hydrolysis product. For metals with several oxidation states, toxicity was based on the stable toxic form common in natural surface waters, e.g., Cu^{+}, Fe^{+++}, and Hg^{++}.

A sample extrapotation calculation is given below:

Critical Concentration for Ammonium Sulfate Based on that for NH_4Cl.

Molecular Weight - $(NH_4)_2SO_4$ - 142

Molecular Weight - NH_4Cl - 53

Sulfate has 2 NH_4^+ Ions and Hence is Equivalent in Toxicity to 2 NH_4Cl Molecules with a Weight of 2 x 53 = 106

ACETALDEHYDE - C_2H_4O

Shipping Forms: 99% - Pure

Specific Gravity: 0.783

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @ 20.08 °C): 760

Environmental Half Life: BOD_5 - 93% theoretical with activated sludge or 1.22 lb/lb[1]

Mammalian Toxicity (mg/Kg body wt): 1900 rat (oral)[99]

Freshwater Critical Concentration: 53 ppm - 96 hr TL_m sunfish[1]

Saltwater Critical Concentration: 70 ppm - 24 hr TL_m pin perch[2]

ACETIC ACID - CH_3COOH

Shipping Forms: 56%, 70%, 80%, and glacial

Specific Gravity: 1.049

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @ 17.5 °C): 10

Environmental Half Life: BOD_5 - 53% theoretical in a respirometer[3]
In natural environment 76% theoretical in freshwater and 66% in saltwater[4]

Mammalian Toxicity (mg/Kg body wt): 3310 rat (oral)[3]

Freshwater Critical Concentration: 75 ppm - 96 hr TL_m bluegill[3]

Saltwater Critical Concentration: 32 ppm - 48 hr TL_m brine shrimp[4]

ACETIC ANHYDRIDE - $(CH_3CO)_2O$

Shipping Forms: 100%

Specific Gravity: 1.083

Solubility (mg/ℓ): 120,000

Vapor Pressure (mm Hg @ 18 °C): 30

Environmental Half Life: Hydrolyzes to acetic acid. Acetic acid BOD_5 - 53% Theoretical in respirometer, 76% in freshwater, and 66% in saltwater[3-4]

Mammalian Toxicity (mg/Kg body wt): 1780 rat (oral)[100]

Freshwater Critical Concentration: 65 ppm - based on 75 ppm - 96 hr TL_m to bluegill for acetic acid

Saltwater Critical Concentration: 28 ppm - based on 32 ppm - 48 hr TL_m to brine shrimp for acetic acid[4]

ACETONE CYANOHYDRIN - C_4H_7NO

Shipping Forms: Pure

Specific Gravity: 0.932

Solubility (mg/ℓ): V. Sol. (100,000)

Vapor Pressure (mm Hg @ _____ °C):

Environmental Half Life: Hydrolyzes to carboxylic acid, releases cyanide upon standing

Mammalian Toxicity (mg/Kg body wt): 13.3 rat (oral)[3]

Freshwater Critical Concentration: 50 ppm - based on NAS rating for aquatic life of 1-100 ppm.[4] Also equivalent to 0.1 of the LD_{50} concentration for a 90 Kg man consuming 2.5 liters of water.

Saltwater Critical Concentration: 50 ppm - based on freshwater level as estimated in NAS rating[4]

ACETYL BROMIDE - $CH_3CO\ Br$

Shipping Forms: Pure

Specific Gravity: 1.520

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydrolyzes to HBr upon contact with water.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 143 ppm - 96 hr TL_m bluegill estimated on basis of HCl and threshold pH of 3.6[1]

Saltwater Critical Concentration: 669 ppm - based on 215 ppm estimated 48 hr LC_{50} to shrimp for HBr employing HCl data.[2]

ACETYL CHLORIDE - $CH_3CO\ C_1$

Shipping Forms: Pure

Specific Gravity: 1.1051

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydrolyzes to HCl upon contact with water.

Mammalian Toxicity (mg/Kg body wt): 2460 rat (oral)[3]

Freshwater Critical Concentration: 10^{-3} 100 ppm - based on 46 ppm - 96 hr TL_m to bluegill for product HCl in alkalinity water[1]

Saltwater Critical Concentration: 466 ppm - based on 215 ppm - estimated 48 hr LC_{50} for shrimp[2]

ACROLEIN - C_3H_4O

Shipping Forms: 100%

Specific Gravity: 0.839

Solubility (mg/l): 400,000

Vapor Pressure (mm Hg @ 7.5 °C): 125

Environmental Half Life: BOD_{10} - 33% theoretical under quiescent conditions[3]

Mammalian Toxicity (mg/Kg body wt): 46 rat (oral)[1]

Freshwater Critical Concentration: 0.88 ppm - estimated 72 hr LC_{50} fathead minnow[3]

Saltwater Critical Concentration: 0.055 ppm - 96 hr EC_{50} oyster[10]

ACRYLONITRILE - $CH_2CH\ CN$

Shipping Forms: 100%

Specific Gravity: 0.807

Solubility (mg/l): 70,000

Vapor Pressure (mm Hg @ 7.5 °C): 40

Environmental Half Life: BOD_{10} - 67% theoretical in river water with sewage seed[3]

Mammalian Toxicity (mg/Kg body wt): 81 rat (oral)[7]

Freshwater Critical Concentration: 11.8 ppm - 96 hr TL_m bluegill[7]

Saltwater Critical Concentration: 22 ppm - estimated 48 hr LC_{50} shrimp[8]

ADIPONITRILE - $CN(CH_2)_4CN$

Shipping Forms: Pure — Specific Gravity: 0.950

Solubility (mg/l): Sl. Sol. (5000) — Vapor Pressure (mm Hg @ _____ °C):

Environmental Half Life: BOD_5 - 40% theoretical in river water under quiescent conditions[2]

Mammalian Toxicity (mg/Kg body wt): 105 rat (oral)[7]

Freshwater Critical Concentration: 820 ppm - 96 hr TL_m fathead minnow[1]

Saltwater Critical Concentration: 820 ppm - estimated as same level as that found in fresh water

ALDRIN - $C_{12}H_8Cl_6$

Shipping Forms: Pure, wettable — Specific Gravity: 1.65

Solubility (mg/l): 0.27 — Vapor Pressure (mm Hg @ 25 °C): 6×10^{-6}

Environmental Half Life: Up to 80% may degrade in 80 weeks forming dieldrin[12] bioconcentrative (8000-shellfish)[11]

Mammalian Toxicity (mg/Kg body wt): 55 rat (oral,[10]

Freshwater Critical Concentration: 0.013 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 0.025 ppm - 96 hr LD_{50} oyster[11]

ALLYL ALCOHOL - $CH_2CH\ CH_2OH$

Shipping Forms: Pure — Specific Gravity: 0.845

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @ 7.5 °C): 8.5

Environmental Half Life: BOD_5 - 9.1% theoretical with sewage seed[3]

Mammalian Toxicity (mg/Kg body wt): 64 rat (oral)[7]

Freshwater Critical Concentration: 0.88 ppm - estimated 72 hr LC_{50} fathead minnow[9]

Saltwater Critical Concentration: 5 ppm - estimated 48 hr LC_{50} shrimp[9]

ALLYL CHLORIDE - $CH_2CH\ CH_2Cl$

Shipping Forms: Pure — Specific Gravity: 0.90

Solubility (mg/l): 3000 — Vapor Pressure (mm Hg @ 7.5 °C): 180

Environmental Half Life: Low BOD anticipated.

Mammalian Toxicity (mg/Kg body wt): 700 rat (oral)[13]

Freshwater Critical Concentration: 42 ppm - 96 hr TL_m bluegill[9]

Saltwater Critical Concentration: 2.4 ppm - 96 hr TL_m sheepshead minnow[9]

ALUMINUM FLUORIDE - AlF_3

Shipping Forms: Anhydrous

Specific Gravity: 3.07

Solubility (mg/l): 559,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Aluminum is precipitated as hydroxide

Mammalian Toxicity (mg/Kg body wt): 600 low lethal dose guinea pig (oral)[9]

Freshwater Critical Concentration: for NaF_3 to rainbow trout[9]: 4.5 ppm - estimated from the 6.7 ppm - hr LC_{50}

Saltwater Critical Concentration: 200 ppm - based on >300 ppm 48 hr LC_{50} to prawn for NaF[9]

ALUMINUM SULFATE - $Al_2(SO_4)_3.18\ H_2O$

Shipping Forms: 80%, and pure, 30-50%

Specific Gravity: 1.69

Solubility (mg/l): 310,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Aluminum is precipated as hydroxide

Mammalian Toxicity (mg/Kg body wt): 770 rat (oral)[10]

Freshwater Critical Concentration: 250 ppm - 96 hr LC_{50} largemouth bass[10]

Saltwater Critical Concentration: 250 ppm - approximated from freshwater data

AMMONIA - NH_3

Shipping Forms: Anhydrous, 30% solution

Specific Gravity: 0.6 as liquid

Solubility (mg/l): 100,000

Vapor Pressure (mm Hg @ 7.5 °C): >760

Environmental Half Life: Biochemical oxidation begins after 4-5 day delay. Degrades to NO_3.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: is extremely pH dependent)[17]: 3.4 ppm - 96 hr TL_m bluegill (toxicity

Saltwater Critical Concentration: 3.4 ppm - approximated from freshwater data

AMMONIUM ACETATE - $NH_4C_2H_3O_2$

Shipping Forms: Pure

Specific Gravity: 1.073

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @ 7.5 °C): >760

Environmental Half Life: BOD_5 - 79% theoretical with activated sludge[1]

Mammalian Toxicity (mg/Kg body wt): 98 mice (I.V.)[9]

Freshwater Critical Concentration: 238 ppm - 96 hr TL_m mosquito fish (turbid water)[1]

Saltwater Critical Concentration: 238 ppm - approximated from freshwater data

AMMONIUM BENZOATE - $NH_4C_7H_5O_2$

Shipping Forms: Pure — Specific Gravity: 1.26

Solubility (mg/l): 196,000 — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Requires some acclimation

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 430 ppm - based on 238 ppm 96 hr TL_m to mosquito fish for ammonium acetate[1]

Saltwater Critical Concentration: 430 ppm - approximated from freshwater data

AMMONIUM BICARBONATE - NH_4HCO_2

Shipping Forms: Pure — Specific Gravity: 1.58

Solubility (mg/l): 119,000 — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Biodegradation begins after 4-5 day delay

Mammalian Toxicity (mg/Kg body wt): 0.234 mice (I.V.)[99]

Freshwater Critical Concentration: 24 ppm - based on 35 ppm threshold to fish for ammonium carbonate[1]

Saltwater Critical Concentration: 24 ppm - approximated from freshwater data

AMMONIUM BICHROMATE - $(NH_4)_2Cr_2O_7$

Shipping Forms: Pure — Specific Gravity: 2.15

Solubility (mg/l): 357,000 — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: [10-19] Chromium can exist in solution indefinately unless trivalent form, [99] and can be concentrated 2000 times.

Mammalian Toxicity (mg/Kg body wt): 67.5 rat (oral)[111]

Freshwater Critical Concentration: 136 ppm - 96 hr TL_m mosquito fish[1]

Saltwater Critical Concentration: 126 ppm - based on 100 ppm 48 hr LC_{50} to brown shrimp for C_rO_3 [99]

AMMONIUM BIFLUORIDE - NH_4HF_2

Shipping Forms: Pure — Specific Gravity: 1.503

Solubility (mg/l): Sol. (100,000) — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Fluoride is precipitated by calcium

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 100 ppm - 48 hr lethal to tinca vulgaris[1]

Saltwater Critical Concentration: 100 ppm - approximated from freshwater data

AMMONIUM BISULFITE - NH_4HSO_3

Shipping Forms: Pure

Specific Gravity: 2.03

Solubility (mg/l): Sol. (50,000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Oxidises in time to nitrate and sulfate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 355 ppm - based on 240 ppm 96 hr TL_m to mosquito fish (turbid water) for ammonium sulfite[1]

Saltwater Critical Concentration: 355 ppm - approximated from freshwater data

AMMONIUM BROMIDE - NH_4Br

Shipping Forms: Pure

Specific Gravity: 2.327

Solubility (mg/l): 680,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Oxidises after 4-5 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 11 ppm - based on 6 ppm 96 hr TL_m to bluegill for ammonium chloride[1]

Saltwater Critical Concentration: 11 ppm - approximated from freshwater data

AMMONIUM CARBAMATE - $NH_4NH_2CO_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): 250,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Biodegradation begins after 4-5 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 9 ppm - based on 6 ppm 96 hr TL_m to bluegill for NH_4Cl[1]

Saltwater Critical Concentration: 9 ppm - approximated from freshwater data

AMMONIUM CARBONATE - $(NH_4)CO_3$

Shipping Forms: Pure

Specific Gravity: 1 917

Solubility (mg/l): 405,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Ammonium oxides after 4-5 days

Mammalian Toxicity (mg/Kg body wt): 96 rat(I.V.)[199]

Freshwater Critical Concentration: 35 ppm - based on 35 ppm threshold to fish.[1]

Saltwater Critical Concentration: 35 ppm - approximated from freshwater data

AMMONIUM CHLORIDE - NH_4Cl

Shipping Forms: Pure — Specific Gravity: 1.53

Solubility (mg/l): 297,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Biodegradation begins after 4-5 days

Mammalian Toxicity (mg/Kg body wt): 30 rat (I.M.)[100]

Freshwater Critical Concentration: 6 ppm - 96 hr TL_m sunfish[1]

Saltwater Critical Concentration: 6 ppm - approximated from freshwater data

AMMONIUM CHROMATE - $(NH_4)_2CrO_4$

Shipping Forms: Pure — Specific Gravity: 1.917

Solubility (mg/l): 405,000 — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Ammonium oxidizes after 4-5 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 240 ppm - 96 hr TL_m mosquito fish (turbid water)[1]

Saltwater Critical Concentration: 240 ppm - approximated from freshwater data

AMMONIUM CITRATE - $(NH_4)_2C_6H_6O_7$

Shipping Forms: Pure — Specific Gravity: 1.48

Solubility (mg/l): V. Sol. (100,000) — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Biodegradable

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 357 ppm - based on 238 ppm 96 hr TL_m to mosquito fish for ammonium acetate[1]

Saltwater Critical Concentration: 357 ppm - approximated from freshwater data

AMMONIUM FLUOBORATE - NH_4BF_4

Shipping Forms: Pure — Specific Gravity: 1.851

Solubility (mg/l): Sol. (100,000) — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Ammonium oxidizes after 4-5 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 12 ppm - based on 6 ppm 96 hr TL_m to bluegill for NH_4Cl[1]

Saltwater Critical Concentration: 12 ppm - approximated from freshwater data

AMMONIUM FLUORIDE - NH_4F

Shipping Forms: Pure

Specific Gravity: 1.315

Solubility (mg/ℓ): 418,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Fluoride is precipitated by calcium

Mammalian Toxicity (mg/Kg body wt): 130 rat (low lethal dose oral)[99]

Freshwater Critical Concentration: 200 ppm - 48 hr lethal to tinca vulgaris[1]

Saltwater Critical Concentration: 200 ppm - approximated from freshwater data

AMMONIUM FORMATE - NH_4CHO_2

Shipping Forms: Pure

Specific Gravity: 1.266

Solubility (mg/ℓ): 1,020,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Biodegradable

Mammalian Toxicity (mg/Kg body wt): 2250 mice (oral)[99]

Freshwater Critical Concentration: 195 ppm - based on 238 ppm 96 hr TL_m to mosquito fish for ammonium acetate[1]

Saltwater Critical Concentration: 195 ppm - approximated from freshwater data

AMMONIUM HYDROXIDE - NH_4OH

Shipping Forms: Pure

Specific Gravity: 0.90

Solubility (mg/ℓ): 100,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Neutralizes with dilution and oxidizes after 4-5 day delay

Mammalian Toxicity (mg/Kg body wt): 350 cat (oral)[100]

Freshwater Critical Concentration: 15 ppm - 48 hr TL_m sunfish[1]

Saltwater Critical Concentration: 15 ppm - approximated from freshwater data

AMMONIUM HYPOPHOSPHITE - $NH_4H_2PO_2$

Shipping Forms: Pure

Specific Gravity: 1.803

Solubility (mg/ℓ): 227,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Oxidizes after 4-5 day delay

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 9.4 ppm - based on 6 ppm 96 hr TL_m to bluegill[1] for NH_4Cl[1]

Saltwater Critical Concentration: 9.4 ppm - approximated from freshwater data

AMMONIUM IODIDE - NH_4I

Shipping Forms: Pure

Specific Gravity: 2.51

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Biodegrades after 4-5 day period

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration for NH_4Cl[1]: 16 ppm - based on 6 ppm 96 hr TL_m to sunfish

Saltwater Critical Concentration: 16 ppm - approximated from freshwater data

AMMONIUM MOLYBDATE - $(NH_4)_2MoO_4$

Shipping Forms: Pure

Specific Gravity: 2.38 - 2.95

Solubility (mg/l): 400,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Degradable after 4-5 days

Mammalian Toxicity (mg/Kg body wt): 330 rat (oral)[99]

Freshwater Critical Concentration for NH_4Cl[1]: 11 ppm - based on 6 ppm 96 hr TL_m to sunfish

Saltwater Critical Concentration: 11 ppm - approximated from freshwater data

AMMONIUM NITRATE - NH_4NO_3

Shipping Forms: Pure

Specific Gravity: 1.66

Solubility (mg/l): 550,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Biodegradable after 4-5 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration for NH_4Cl[1]: 8.9 ppm - based on 6 ppm 96 hr TL_m to sunfish

Saltwater Critical Concentration: 8.9 ppm - approximated from freshwater data

AMMONIUM OXALATE - $(NH_4)_2C_2O_2.H_2O$

Shipping Forms: Pure

Specific Gravity: 1.50

Solubility (mg/l): 25,400

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Biodegradable

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 219 ppm - based on 238 ppm 96 hr TL_m to mosquito fish for ammonium acetate[1]

Saltwater Critical Concentration: 219 ppm - approximated from freshwater data

AMMONIUM PENTABORATE - $NH_4B_5O_8 \cdot 4H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): 70,300

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Persistent for more than 4 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 30 ppm - based on 6 ppm 96 hr TL_m to sunfish for NH_4Cl[1]

Saltwater Critical Concentration: 30 ppm - approximated from freshwater data

AMMONIUM PERSULFATE - $(NH_4)_2S_2O_8$

Shipping Forms: Pure

Specific Gravity: 1.98

Solubility (mg/ℓ): 582,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Degrades after 4-5 days

Mammalian Toxicity (mg/Kg body wt): 820 rat (oral)[9]

Freshwater Critical Concentration: 13 ppm - based on 6 ppm 96 hr TL_m to sunfish for NH_4Cl[1]

Saltwater Critical Concentration: 13 ppm - approximated from freshwater data

AMMONIUM SILICOFLUORIDE - $(NH_4)_2SiF_6$

Shipping Forms: Pure

Specific Gravity: 2.01

Solubility (mg/ℓ): 185,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Ammonia degrades after 4-5 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 50 ppm - 48 hr lethal to tinca vulgaris[1]

Saltwater Critical Concentration: 50 ppm - approximated from freshwater data

AMMONIUM SULFAMATE - $NH_4NH_2SO_3$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Persists in soil for 1-3 months

Mammalian Toxicity (mg/Kg body wt): 3900 Rat (oral)[9]

Freshwater Critical Concentration: 203 ppm - 96 hr TL_m catfish[1]

Saltwater Critical Concentration: 203 ppm - approximated from freshwater data

AMMONIUM SULFATE - $(NH_4)_2\ SO_4$

Shipping Forms: Pure

Specific Gravity: 1.769

Solubility (mg/l): 706,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Degrades after 4-5 days

Mammalian Toxicity (mg/Kg body wt): 3000 rat (oral)[99]

Freshwater Critical Concentration: 8 ppm - based on 6 ppm 96 hr TL_m to sunfish for NH_4Cl[1]

Saltwater Critical Concentration: 8 ppm - approximated from freshwater data

AMMONIUM SULFIDE - $(NH_4)_2\ S$

Shipping Forms: 40-44% liquid, 50-55% by-product liquid

Specific Gravity: 1.2

Solubility (mg/l): 582,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Sulfide precipitates while ammonium will degrade after 4-5 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 248 ppm - 96 hr TL_m mosquito fish (turbid water)[1]

Saltwater Critical Concentration: 248 ppm - approximated from freshwater data

AMMONIUM SULFITE - $(NH_4)_2\ SO_3.H_2O$

Shipping Forms: Pure

Specific Gravity: 1.41

Solubility (mg/l): 324,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Sulfite oxidizes while ammonium is oxidized after 4-5 days

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 240 ppm - based on 96 hr TL_m to mosquito fish[1]

Saltwater Critical Concentration: 240 - approximated from freshwater data

AMMONIUM TARTRATE - $(NH_4)_2\ C_4H_4O_6$

Shipping Forms: Pure

Specific Gravity: 1.601

Solubility (mg/l): 63,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Biodegradable

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 285 ppm - based on 238 ppm 96 hr TL_m to mosquito fish for ammonium acetate[1]

Saltwater Critical Concentration: 285 ppm - approximated from freshwater data

AMMONIUM THIOCYANATE - NH_4SCN

Shipping Forms: Pure, 50% solution

Specific Gravity: 1.310

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Oxidizes with time

Mammalian Toxicity (mg/Kg body wt): 500 rat (I.P.)[88]

Freshwater Critical Concentration: 114 ppm - 96 hr LC_{50} mosquito fish[11]

Saltwater Critical Concentration: 114 ppm - approximated from freshwater data

AMMONIUM THIOSULFATE - $(NH_4)_2 S_2O_3$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Oxidizes to nitrate and sulfate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 265 ppm - based on 240 ppm 96 hr TL_m to mosquito fish for ammonium sulfite[1]

Saltwater Critical Concentration: 265 ppm - approximated from freshwater data

AMYL ACETATE - $CH_3COO(CH_2)_4CH_3$

Shipping Forms: Pure

Specific Gravity: 0.90

Solubility (mg/l): 820

Vapor Pressure (mm Hg @ 7.5 °C): 1.7

Environmental Half Life: BOD_5 - 38% theoretical, 64% in freshwater, and 35% in saltwater[10, 5]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 65 ppm - 96 hr TL_m mosquito fish[1]

Saltwater Critical Concentration: 53 ppm - 24 hr TL_m brine shrimp[4]

ANILINE - C_6H_7N

Shipping Forms: Pure

Specific Gravity: 1.002

Solubility (mg/l): 35,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 1.5 - 2.26 lb/lb using sewage seed[31] (60% of theoretical)

Mammalian Toxicity (mg/Kg body wt): 750 rat (oral)[7]

Freshwater Critical Concentration: 11 ppm - 96 hr TL_m bluegill[88]

Saltwater Critical Concentration: 11 ppm - approximated as same as that for freshwater

ANTIMONY PENTACHLORIDE - $SbCl_5$

Shipping Forms: Pure

Specific Gravity: 2.336

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Decomposes to Sb_2O_5 and HCl. Can accumulate in marine life.

Mammalian Toxicity (mg/Kg body wt): 675 rat (oral)[1]

Freshwater Critical Concentration: 22 ppm - based on 17 ppm 96 hr TL_m to fathead minnow for $SbCl_3$[1]

Saltwater Critical Concentration: 22 ppm - approximated from freshwater data

ANTIMONY PENTAFLUORIDE - SbF_5

Shipping Forms: Pure

Specific Gravity: 2.99

Solubility (mg/l): Sol. (50,000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: (Hydrolyze) to Sb_2O_5 and HF. Can accumulate in marine life

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 6.9 ppm - based on 6.7 ppm 48 hr LC_{50} to rainbow trout for HaF[93]

Saltwater Critical Concentration: 16 ppm - based on 17 ppm 96 hr TL_m to fathead minnows for $SbCl_3$[1]

ANTIMONY POTASSIUM TARTRATE - $KSbC_4H_4O_7 \cdot \frac{1}{2}H_2O$

Shipping Forms: Pure

Specific Gravity: 2.6

Solubility (mg/l): 8300

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Can accumulate in marine life up to 15,000 times[33]

Mammalian Toxicity (mg/Kg body wt): 300 rat (oral)[1]

Freshwater Critical Concentration: 32 ppm - based on 96 hr TL_m to fathead minnow[1]

Saltwater Critical Concentration: 32 ppm - approximated from freshwater data

ANTIMONY TRIBROMIDE - $SbBr_3$

Shipping Forms: Pure

Specific Gravity: 4.148

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Decomposes to Sb_2O_3 and HBr

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 27 ppm - based on 17 ppm 96 hr TL_m to fathead minnow for $SbCl_3$[1]

Saltwater Critical Concentration: 27 ppm - approximated from freshwater data

ANTIMONY TRICHLORIDE - $SbCl_3$

Shipping Forms: Pure

Specific Gravity: 3.14

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Antimony concentrates up to 15,000 times[2]

Mammalian Toxicity (mg/Kg body wt): 675 rat (oral)[1,3]

Freshwater Critical Concentration: 17 ppm - 96 hr TL_m fathead minnow[1]

Saltwater Critical Concentration: 17 ppm - approximated from freshwater data

ANTIMONY TRIFLUORIDE - SbF_3

Shipping Forms: Pure

Specific Gravity: 4.379

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Will precipitate in time. Can concentrate in marine life.

Mammalian Toxicity (mg/Kg body wt): 100 guinea pig (LD low oral)[3]

Freshwater Critical Concentration: 13 ppm - based on 17 ppm 96 hr TL_m to fathead minnow for $SbCl_3$[1]

Saltwater Critical Concentration: 13 ppm - approximated from freshwater data

ANTIMONY TRIODIDE - SbI_3

Shipping Forms: Pure

Specific Gravity: 4.768

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Decomposes to Sb_2O_3 and HI. Can accumulate in marine life.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 37 ppm - based on 17 ppm 96 hr TL_m to fathead minnow for $SbCl_3$[1]

Saltwater Critical Concentration: 37 ppm - approximated from freshwater data

ANTIMONY TRIOXIDE - Sb_2O_3

Shipping Forms: Pure

Specific Gravity: 5.2

Solubility (mg/l): 50,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Can concentrate up to 15,000 times.[2]

Mammalian Toxicity (mg/Kg body wt): >20,000 rat (oral)[1,3]

Freshwater Critical Concentration (listed as >80 ppm)[1]: 100 ppm - estimated 96 hr TL_m fathead minnow

Saltwater Critical Concentration: 100 ppm - approximated from freshwater data

ARSENIC ACID - $H_3AsO_4 \cdot \frac{1}{2}H_2O$

Shipping Forms: Pure

Specific Gravity: 2-2.5

Solubility (mg/l): 167,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Arsenic can be concentrated 300 times.[11]

Mammalian Toxicity (mg/Kg body wt): 8 rabbit (I.V.)[10]

Freshwater Critical Concentration: 11 ppm - approximated from the 30 ppm 168 hr TL_m to goldfish reported for the sodium salt[1]

Saltwater Critical Concentration: 4.3 ppm - this concentration of arsenic was toxic to crabs in 264 hours.[1]

ARSENIC DISULFIDE - As_2S_2

Shipping Forms: Pure

Specific Gravity: 3.506

Solubility (mg/l): Insol. (100)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Will oxidize in time. Arsenic can be concentrated 300 times.[11]

Mammalian Toxicity (mg/Kg body wt.):

Freshwater Critical Concentration: 11 ppm - based on 10 ppm lethal level to bluegill for As_2O_3[1]

Saltwater Critical Concentration: 4 ppm - based on ratio of fresh to saltwater toxicity for arsenic acid

ARSENIC PENTAOXIDE - As_2O_5

Shipping Forms: Pure

Specific Gravity: 4.08

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Arsenic can be concentrated 300 times.[11]

Mammalian Toxicity (mg/Kg body wt): 8 rat (oral)[10]

Freshwater Critical Concentration: 16 ppm - based on the 30 ppm 168 hr TL_m to goldfish reported for sodium arsenate[1]

Saltwater Critical Concentration: 6 ppm - based on the toxicity of arsenic to crabs over a 264 hour period[1]

ARSENIC TRIBROMIDE - $AsBr_3$

Shipping Forms: Pure

Specific Gravity: 3.54

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Decomposes in water to As_2O_3.[1] Arsenic can be concentrated 300 times.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 32 ppm - based on 10 ppm lethal level to bluegill for hydrolysis product As_2O_3[1]

Saltwater Critical Concentration: 12 ppm - based on ratio of fresh to saltwater toxicity for arsenic acid

ARSENIC TRICHLORIDE - $AsCl_3$

Shipping Forms: Pure

Specific Gravity: 2.163

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Decomposes to As_2O_3 and HCl in water. Arsenic can be concentrated 300 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 19 ppm - based on 10 ppm lethal level to bluegill for hydrolysis product As_2O_3[1]

Saltwater Critical Concentration: 7.4 ppm - based on ratio of fresh to saltwater toxicity for arsenic acid

ARSENIC TRIFLUORIDE - AsF_3

Shipping Forms: Pure

Specific Gravity: 2.666

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Decomposes to As_2O_3 and HF in water. Arsenic can be concentrated 300 times.[1]

Mammalian Toxicity (mg/Kg body wt): 20 guinea pig (subcutaneous)[1]

Freshwater Critical Concentration: 14 ppm - based on 10 ppm lethal level to bluegill for As_2O_3 hydrolysis product[1]

Saltwater Critical Concentration: 6 ppm - based on ratio of salt to freshwater toxicity for arsenic acid

ARSENIC TRIIODIDE - AsIs

Shipping Forms: Pure

Specific Gravity: 4.688

Solubility (mg/l): 83,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydrolyzes to As_2O_3 and HI. Arsenic can be concentrated 300 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 46 ppm - based on 10 ppm lethal level to bluegill for hydrolysis product As_2O_3[1]

Saltwater Critical Concentration: 18 ppm - based on ratio of salt to freshwater toxicity for arsenic acid

ARSENIC TRIOXIDE - As_2O_3

Shipping Forms: Pure

Specific Gravity: 3.865

Solubility (mg/l): 1200

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Persistent. Arsenic can be concentrated 300 times.[1]

Mammalian Toxicity (mg/Kg body wt): 45 rat (oral)

Freshwater Critical Concentration: 10 ppm - lethal to bluegill[1]

Saltwater Critical Concentration: 3.9 ppm - based on ratio of salt to freshwater toxicity for arsenic acid

ARSENIC TRISULFIDE - As_2S_3

Shipping Forms: Pure

Specific Gravity: 3.43

Solubility (mg/ℓ): 0.5

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Will oxidize in time. Arsenic can be concentrated 300 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 12 ppm - based on 10 ppm lethal level to bluegill for As_2O_3[1]

Saltwater Critical Concentration: 5 ppm - based on ratio of fresh to saltwater toxicity for arsenic acid

BENZENE - C_6H_6

Shipping Forms: Pure

Specific Gravity: 0.879

Solubility (mg/ℓ): 820

Vapor Pressure (mm Hg @ 22 °C): 820

Environmental Half Life: BOD_5 - 1.9% theoretical with sewage seed in quiescent environment[1] - 24% in a freshwater system[4]

Mammalian Toxicity (mg/Kg body wt): 5600 rat (oral)[1]

Freshwater Critical Concentration: 31 ppm - 96 hr TL_m bluegill[14]

Saltwater Critical Concentration: 21 ppm - 48 hr TL_m brine shrimp[4]

BENZOIC ACID - $C_7H_6O_2$

Shipping Forms: Pure

Specific Gravity: 1.266

Solubility (mg/ℓ): 2100

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 1.4 lb/lb (71%) with sewage seed[21]

Mammalian Toxicity (mg/Kg body wt): 1700 rat (oral)[104]

Freshwater Critical Concentration: 180 ppm - 96 hr TL_m mosquito fish in turbid water

Saltwater Critical Concentration: 180 ppm - approximated from freshwater data

BENZONITRILE - C_6H_5CN

Shipping Forms: Pure

Specific Gravity: 1.01

Solubility (mg/ℓ): 10,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_4 - 60% theoretical with river water[4]

Mammalian Toxicity (mg/Kg body wt): 180 rat (subcutaneous)[104]

Freshwater Critical Concentration: 78 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 78 ppm - approximated from freshwater data

BENZOYL CHLORIDE - C_7H_5ClO

Shipping Forms: Pure

Specific Gravity: 1.20

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 71% for benzoic acid by-product[21] - HCl will be neutralized naturally

Mammalian Toxicity (mg/Kg body wt): 31.3 rat (I.P. low LD)[99]

Freshwater Critical Concentration: 180 ppm - based on 46 ppm 96 hr TL_m to bluegill for the HCl hydrolysis product[1]

Saltwater Critical Concentration: 940 ppm - based on 240 ppm 48 hr LC_{50} to crabs for the HCl hydrolysis product.[1]

BENZYL CHLORIDE - $C_6H_5CH_2Cl$

Shipping Forms: Pure

Specific Gravity: 1.10

Solubility (mg/ℓ): 33

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Slowly hydrolyses to HCl and benzyl alcohol

Mammalian Toxicity (mg/Kg body wt): 50 rat (subcutaneous) low TD[99]

Freshwater Critical Concentration: 160 ppm - based on 46 ppm 96 hr TL_m to bluegill for HCl hydrolysis product[1]

Saltwater Critical Concentration: 845 ppm - based on 240 ppm 48 hr LC_{50} to crabs for HCl hydrolysis product[1]

BERYLLIUM CHLORIDE - $BeCl_2$

Shipping Forms: Pure

Specific Gravity: 1.90

Solubility (mg/ℓ): V. Sol. (>100,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts are insoluble. Beryllium can be concentrated 100 times.[1]

Mammalian Toxicity (mg/Kg body wt): 86 rat (oral)[101]

Freshwater Critical Concentration: 133 ppm - based on 15 ppm 96 hr TL_m to fathead minnows for beryllium ion added as chloride salt[1]

Saltwater Critical Concentration: 133 ppm - approximated from freshwater data

BERYLLIUM FLUORIDE - BeF_2

Shipping Forms: Pure

Specific Gravity: 1.986

Solubility (mg/ℓ): V. Sol. (100,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts are insoluble. Beryllium can be concentrated 100 times.[1]

Mammalian Toxicity (mg/Kg body wt): 98 rat (oral)[99]

Freshwater Critical Concentration: 3.7 ppm - based on 6.7 ppm 48 hr LC_{50} to rainbow trout for BeF_2[1]

Saltwater Critical Concentration: 78 ppm - approximated from freshwater data for beryllium ion 15ppm 9. hr TL_m to bluegill[1]

BERYLLIUM HYDROXIDE - $Be(OH)_2$

Shipping Forms: Pure

Specific Gravity: 1.909

Solubility (mg/ℓ): 2

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Carbonate salt is insoluble. Beryllium can be concentrated 100 times.[23]

Mammalian Toxicity (mg/Kg body wt): 0.8 rat (I.V. as Be)[22]

Freshwater Critical Concentration: 57 ppm - based on 12 ppm 96 hr TL_m to bluegill for beryllium ion added as sulfate salt[1]

Saltwater Critical Concentration: 57 ppm - approximated from freshwater data

BERYLLIUM NITRATE - $Be(NO_3)_2 \cdot 3H_2O$

Shipping Forms: Pure

Specific Gravity: 1.56

Solubility (mg/ℓ): V. Sol. (>100,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate are insoluble. Beryllium can be concentrated 100 times.[23]

Mammalian Toxicity (mg/Kg body wt.): 50 rat (I.P.)[22]

Freshwater Critical Concentration: 415 ppm - 96 hr TL_m fathead minnow[1]

Saltwater Critical Concentration: 415 ppm - approximated from freshwater data

BERYLLIUM SULFATE - $BeSO_4 \cdot 4H_2O$

Shipping Forms: Pure

Specific Gravity: 2.4

Solubility (mg/ℓ): 425,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts are insoluble. Beryllium can be concentrated 100 times.[23]

Mammalian Toxicity (mg/Kg body wt): 82 rat (oral)[22]

Freshwater Critical Concentration: 236 ppm - based on a 12 ppm 96 hr TL_m to bluegill for the beryllium ion added as sulfate salt[1]

Saltwater Critical Concentration: 236 ppm - approximated from freshwater data

BRUCINE - $C_{23}H_{26}N_2O_4$

Shipping Forms:

Specific Gravity: >1.0

Solubility (mg/ℓ): 1200

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Moderately persistent

Mammalian Toxicity (mg/Kg body wt): 8 dog (L.V.)[22]

Freshwater Critical Concentration: 28 ppm - based on data for strychnine

Saltwater Critical Concentration: 1.7 ppm - based on data for strychnine

BUTYL ACETATE - $CH_3COO(CH_2)_3CH_3$

Shipping Forms: Pure

Specific Gravity: 0.883

Solubility (mg/ℓ): 8300

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: BOD_5 - 23% theoretical with sewage seed, 58% in freshwater, and 40% in saltwater[14,*]

Mammalian Toxicity (mg/Kg body wt): 4130 rat (oral)[1]

Freshwater Critical Concentration: 58 ppm - based on 65 ppm 96 hr TL_m to mosquito fish for amyl acetate[1]

Saltwater Critical Concentration: 32 ppm - 48 hr TL_m brine shrimp*

BUTYL AMINE - $CH_3(CH_2)_3NH_2$

Shipping Forms: Pure

Specific Gravity: 0.8

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @ 7.5 °C): 54

Environmental Half Life: BOD_5 - 26.5% theoretical with sewage seed[19]

Mammalian Toxicity (mg/Kg body wt): 500 rat (oral)[19]

Freshwater Critical Concentration: 20 ppm - lower threshold of 24 hour critical range for fish[24]

Saltwater Critical Concentration: 20 ppm - approximated from freshwater data

BUTYRIC ACID - $CH_3(CH_2)_2COOH$

Shipping Forms: Pure

Specific Gravity: 1.00

Solubility (mg/ℓ): 56,000

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: BOD_5 - 1.15 lb/lb (63%) with and without acclimated seed[19]

Mammalian Toxicity (mg/Kg body wt): 2940 rat (oral)[19]

Freshwater Critical Concentration: 200 ppm - 24 hr TL_m bluegill[27]

Saltwater Critical Concentration: 200 ppm - approximated from freshwater data

CADMIUM ACETATE - $Cd(C_2H_3O_2)_2 \cdot 3H_2O$

Shipping Forms: Pure

Specific Gravity: 2.34

Solubility (mg/ℓ): >100,000

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Cadmium is bioconcentrative by a factor of 3000.[27] The carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 6.3 ppm - based on 5 ppm 96 hr TL_m to fathead minnows for $CdCl_2.2\frac{1}{2}H_2O$[1]

Saltwater Critical Concentration: 17 ppm - based on 6.6 ppm 96 hr LC_{50} to oysters for cadmium ion[16]

CADMIUM BROMIDE - $CdBr_2 \cdot 4H_2O$

Shipping Forms: Pure

Specific Gravity: 5.19

Solubility (mg/ℓ): 1,210,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cadmium is bioconcentrative by a factor of 3000.[3] The carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 7.5 ppm - based on 5 ppm 96 hr TL_m to fathead minnows for $CdCl_2 \cdot 2\frac{1}{2}H_2O$[1]

Saltwater Critical Concentration: 20 ppm - based on 6.6 ppm 96 hr LC_{50} to oysters for cadmium ion[3]

CADMIUM CHLORIDE - $CdCl_2 \cdot 2\frac{1}{2}H_2O$

Shipping Forms: Pure

Specific Gravity: 3.327

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cadmium is bioconcentrative by a factor of 3000.[3] The carbonate and hydroxide salts are insoluble

Mammalian Toxicity (mg/Kg body wt): 88 rat (oral)[3]

Freshwater Critical Concentration: 5 ppm - 96 hr TL_m fathead minnow[1]

Saltwater Critical Concentration: 13 ppm - based on 6.6 ppm 96 hr LC_{50} to oyster for cadmium ion[3]

CADMIUM NITRATE - $Cd(NO_3)_2 \cdot 4H_2O$

Shipping Forms: Pure

Specific Gravity: 2.45

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cadmium is bioconcentrative by a factor of 3000.[3] The carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt): 100-600 dog (oral as Cd)[1]

Freshwater Critical Concentration: 6.8 ppm - nased on 5 ppm 96 hr TL_m to fathead minnow for $CdCl_2 \cdot 2\frac{1}{2}H_2O$[1]

Saltwater Critical Concentration: 18 ppm - based on 6.6 ppm 96 hr LC_{50} to oysters for cadmium ion[3]

CADMIUM SULFATE - $3CdSO_4 \cdot 8H_2O$

Shipping Forms: Pure

Specific Gravity: 3.09

Solubility (mg/ℓ): 1,140,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cadmium is bioconcentrative by a factor of 3000.[3] The carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt): 150-600 (oral as Cd)[1]

Freshwater Critical Concentration: 5.6 ppm - based on 5 ppm 96 hr TL_m to fathead minnow for $CdCl_2 \cdot 2\frac{1}{2}H_2O$

Saltwater Critical Concentration: 15.1 ppm - based on 6.6 ppm 96 hr TL_m to oysters for cadmium ion[3]

CALCIUM ARSENATE - $Ca_3(AsO_4)_2.3H_2O$

Shipping Forms: Pure

Specific Gravity:

Solubility (mg/ℓ): 130

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Arsenic can be concentrated 300 times.[2]

Mammalian Toxicity (mg/Kg body wt): 298 rat (oral)[9]

Freshwater Critical Concentration: 16 ppm - based on 30 ppm 168 hr TL_m to goldfish for the sodium salt[1]

Saltwater Critical Concentration: 11 ppm - based on 4.3 ppm as a toxic to crabs over a 264 hr period[1]

CALCIUM ARSENITE - $Ca(AsO_2)_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): Sl. Sol. (5000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Oxidizes to arsenate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 34 ppm - based on 35 ppm 96 hr LC_{50} to bluegill for sodium arsenite[1,2]

Saltwater Critical Concentration: 34 ppm - approximated from freshwater data

CALCIUM CARBIDE - CaC_2

Shipping Forms: Pure

Specific Gravity: 2.2

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Neutralized slowly

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 138 ppm - based on 160 ppm 96 hr TL_m to mosquito fish for the hydrolysis product $Ca(OH)_2$[1]

Saltwater Critical Concentration: 138 ppm - approximated from freshwater data

CALCIUM CHROMATE - $CaCrO_4.2H_2O$

Shipping Forms: Pure

Specific Gravity: 2.89

Solubility (mg/ℓ): 224,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Can exist in solution indefinately unless reduced to trivalent form.[16-19] Can be concentrated 2000 times.[2]

Mammalian Toxicity (mg/Kg body wt): 40 rat (I.M. low lethal dose)[9]

Freshwater Critical Concentration: 235 ppm - based on 420 ppm 96 hr TL_m to mosquito fish for the sodium salt[1]

Saltwater Critical Concentration: 479 ppm - based on 100 ppm 48 hr LC_{50} to brown shrimp for CrO_3[1]

CALCIUM CYANIDE - $Ca(CN)_2$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/ℓ): Decomposes — Vapor Pressure (mm Hg @ _____°C):

Environmental Half Life: Decomposes to $Ca(OH)_2$ and HCN until the alkalinity is high enough to stabilize $Ca(CN)_2$. Cyanide oxidizes to less toxic cyanate.

Mammalian Toxicity (mg/Kg body wt): 39 rat (oral)[99]

Freshwater Critical Concentration for cyanide ion[1]: .22 ppm - based on .12 ppm 96 hr TL_m to sunfish

Saltwater Critical Concentration for HCN[8]: .18 ppm - based on .25 ppm 48 hr LC_{50} to prawns

CALCIUM DODECYLBENZENESULFONATE - $(O_3SC_{18}H_{30})$ Ca

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/ℓ): Sol. (10,000) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 43% theoretical with activated sludge based on sodium salt[81]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration for sodium salt[79]: 20 ppm - based on 19 ppm 96 hr TL_m to bluegill

Saltwater Critical Concentration for sodium salt[79]: 11 ppm - based on 10.1 ppm 96 hr TL_m to mullet

CALCIUM HYDROXIDE - $Ca(OH)_2$

Shipping Forms: Pure — Specific Gravity: 2.504

Solubility (mg/ℓ): 1850 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Neutralizes slowly

Mammalian Toxicity (mg/Kg body wt): 7340 rat (oral)[100]

Freshwater Critical Concentration: 160 ppm - 96 hr TL_m mosquito fish[1]

Saltwater Critical Concentration: 160 ppm - approximated from freshwater data

CALCIUM HYPOCHLORITE - $Ca(C_{10})_2.2H_2O$

Shipping Forms: Pure — Specific Gravity: 2.35

Solubility (mg/ℓ): >100,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Subject to equilibrium partition between $Ca(OH)_2$, HOCl, OCl^-, and Cl_2.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: .25 ppm - based on .1 ppm 96 hr TL_{50} to fathead minnow for equilibrium product Cl_2[11]

Saltwater Critical Concentration: 2.5 ppm - based on 1 ppm toxicity of Cl_2 by-product to oysters[1]

CALCIUM OXIDE - CaO

Shipping Forms: Pure — Specific Gravity: 3.25

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Neutralises slowly. Hydrated form is $Ca(OH)_2$.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 121 ppm - based on 160 ppm 96 hr TL_m to mosquito fish for hydrated form[1]

Saltwater Critical Concentration: 121 ppm - based on freshwater data

CAPTAN - $C_9H_8Cl_3NO_2S$

Shipping Forms: Pure, wettable — Specific Gravity: 1.74

Solubility (mg/l): Insol. — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Readily hydrolyses - 2 week residual life[1]

Mammalian Toxicity (mg/Kg body wt): 38 rabbit (low lethal dose oral)[10]

Freshwater Critical Concentration: 0.32 ppm - 72 hr TL_m large trout[1]

Saltwater Critical Concentration: 0.32 ppm - approximated from freshwater data

CARBON DISULFIDE - CS_2

Shipping Forms: Pure — Specific Gravity: 1.263

Solubility (mg/l): 2200 — Vapor Pressure (mm Hg @ 7.5 °C): 1850

Environmental Half Life: Relatively persistent

Mammalian Toxicity (mg/Kg body wt): 100-199 mammal (oral)[7]

Freshwater Critical Concentration: 135 ppm - 48 hr TL_m mosquito fish in turbid water[11]

Saltwater Critical Concentration: 135 ppm - approximated from freshwater data

CATECHOL - $C_6H_6O_2$

Shipping Forms: Pure — Specific Gravity: 1.34

Solubility (mg/l): 400,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - .69 lb/lb (37% theoretical) with sewage seed[11]

Mammalian Toxicity (mg/Kg body wt): 3890 rat (oral)[10]

Freshwater Critical Concentration: 14 ppm - 48 hr TL_m goldfish[1]

Saltwater Critical Concentration: 14 ppm - approximated from freshwater data

CHLORDANE - $C_{10}H_6Cl_8$

Shipping Forms: Pure, wettable — Specific Gravity: 1.67

Solubility (mg/ℓ): Insol. (1) — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: An 85% reduction over 2 weeks in river water has been noted with subsequent persitence at that level for 8 weeks.[1] Eastern oyster accumulated to 7300 times ambient levels in 10 days at .01 ppm in water[1]

Mammalian Toxicity (mg/Kg body wt): 395 rat (oral)[1]

Freshwater Critical Concentration: 0.022 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 0.015 ppm - 96 hr TL_{50} Korean shrimp[1]

CHLORINE - Cl_2

Shipping Forms: Pure — Specific Gravity: Gas - .0032

Solubility (mg/ℓ): 14,600 — Vapor Pressure (mm Hg @ 7.5 °C): 760

Environmental Half Life: Hydrolyses to OCl^- and Cl^-. Most waters have chlorine demands which rapidly diminish the toxic level.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 0.1 ppm - 96 hr TL_{50} fathead minnow[1]

Saltwater Critical Concentration: 1.0 ppm - termination of pumping in oysters[1]

CHLOROBENZENE - C_6H_5Cl

Shipping Forms: Pure — Specific Gravity: 1.107

Solubility (mg/ℓ): 488 — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: BOD_5 - .03 lb/lb (1% theoretical) with sewage seed[1]

Mammalian Toxicity (mg/Kg body wt): 2910 rat (oral)[1]

Freshwater Critical Concentration: 20 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 20 ppm - approximated from freshwater data

CHLOROFORM - $CHCl_3$

Shipping Forms: Pure — Specific Gravity: 1.49

Solubility (mg/ℓ): 1000 — Vapor Pressure (mm Hg @ 7.5 °C): 84

Environmental Half Life: BOD_5 - .008 lb/lb (2.4%) with sewage seed[1]

Mammalian Toxicity (mg/Kg body wt): 1875 rat (oral)[1]

Freshwater Critical Concentration: 125 ppm - estimated 72 hr LC_{50} to fathead minnow[1]

Saltwater Critical Concentration: 125 ppm - approximated from freshwater data

CHLOROSULFONIC ACID - $ClSO_3H$

Shipping Forms: Pure

Specific Gravity: 1.766

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydrolyzes to HCl and H_2SO_4 which slowly neutralize

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 74 ppm - based on 96 hr pH threshold to bluegill for HCl and H_2SO_4 hydrolysis products[1]

Saltwater Critical Concentration: 346 ppm - based on 215 ppm 48 hr LC_{50} to shrimp for pH level resulting from product HCl and H_2SO_4[1]

CHROMIC ACETATE - $Cr(C_2H_3O_2)_3.H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): Sol. (50,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Trivalent chromium will precipitate. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt): 2.29 mouse (low lethal dose I.V.)[11]

Freshwater Critical Concentration: 6.2 ppm - based on 1.3 ppm lethal level in 1 week to stickleback for trivalent chromium[1]

Saltwater Critical Concentration: 18 ppm - based on freshwater to saltwater toxicity ratio for chromic acid

CHROMIC ACID - CrO_3

Shipping Forms: Pure

Specific Gravity: 2.7

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Dissolved chrome will persist indefinitely in water until reduced to trivalent form. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt): 330 dog (oral)[11]

Freshwater Critical Concentration: 33 ppm - 96 hr TL_m fathead minnow[11]

Saltwater Critical Concentration: 100 ppm - 48 hr LC_{50} brown shrimp[11]

CHROMIC SULFATE - $Cr_2(SO_4)_3.15H_2O$

Shipping Forms: Pure

Specific Gravity: 1.867

Solubility (mg/ℓ): Sol. (50,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Oxide soon precipitates. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt): 247 mouse (low lethal dose I.V.)[11]

Freshwater Critical Concentration: 9 ppm - based on 1.3 ppm lethal level in 1 week to stickleback for trivalent chromium[1]

Saltwater Critical Concentration: 27 ppm - based on saltwater to freshwater toxicity ratio for chromic acid

CHROMOUS CARBONATE - $CrCO_3$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): V. Sl. Sol. (500)

Vapor Pressure (mm Hg @____°C): Negligible

Environmental Half Life: Soon oxidized to trivalent form which precipitates. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 2.8 ppm - based on critical concentration for trivalent chromium[1]

Saltwater Critical Concentration: 9 ppm - based on freshwater - saltwater toxicity ratio for chromic acid

CHROMOUS CHLORIDE - $CrCl_2$

Shipping Forms: Pure

Specific Gravity: 2.75

Solubility (mg/l): V. Sol. (100,000)

Vapor Pressure (mm Hg @____°C): Negligible

Environmental Half Life: Soon oxidized to trivalent form which precipitates. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 3 ppm - based on critical concentration for trivalent chromium[1]

Saltwater Critical Concentration: 9 ppm - based on freshwater - saltwater toxicity ratio for chromic acid

CHROMOUS OXALATE - $CrC_2O_4.H_2O$

Shipping Forms: Pure

Specific Gravity: 2.46

Solubility (mg/l): Sol. (50,000)

Vapor Pressure (mm Hg @____°C): Negligible

Environmental Half Life: Soon oxidizes to trivalent form which precipitates. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 4.0 ppm - based on critical concentration for trivalent chromium.[1]

Saltwater Critical Concentration: 12 ppm - based on freshwater - saltwater toxicity ratio for chromic acid

CHROMYL CHLORIDE - CrO_2Cl_2

Shipping Forms: Pure

Specific Gravity: 1.91

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @____°C): Negligible

Environmental Half Life: Decomposes to CrO_3 and HCl. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt): 5.45 mouse (S.C.)[44]

Freshwater Critical Concentration: 51 ppm - based on 33 ppm 96 hr TL_m to fathead minnow for hydrolysis product CrO_3[11]

Saltwater Critical Concentration: 155 ppm - based on 100 ppm 48 hr LC_{50} to brown shrimp for hydrolysis product CrO_3[11]

COBALTOUS ACETATE - $Co(C_2H_3O_2).4H_2O$

Shipping Forms: Pure

Specific Gravity: 1.7

Solubility (mg/ℓ): Sol. (10,000-100,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cobalt can be concentrated 200-1000 times.[11] Carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 42 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 840 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion[11]

COBALTOUS BROMIDE - $CoBr_2$

Shipping Forms: Pure

Specific Gravity: 4.909

Solubility (mg/ℓ): 667,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Carbonate and hydroxide salts will precipitate. Cobalt can be concentrated 200-1000 times.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 37 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 742 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion[11]

COBALTOUS CHLORIDE - $CoCl_2.6H_2O$

Shipping Forms: Pure

Specific Gravity: 1.942

Solubility (mg/ℓ): 767,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cobalt can be concentrated 200-1000 times.[11] Carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt): 180 rat (oral)[11]

Freshwater Critical Concentration: 40 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion.[1]

Saltwater Critical Concentration: 800 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion.[11]

COBALTOUS CITRATE - $Co_3(C_6H_5O_7).2H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): 8000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Carbonate and hydroxide salts will precipitate. Cobalt can be concentrated 200-1000 times.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 33 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion.[1]

Saltwater Critical Concentration: 668 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion.[11]

COBALTOUS FLUORIDE - $CoF_2 \cdot 2H_2O$

Shipping Forms: Pure

Specific Gravity: 4.43

Solubility (mg/ℓ): Sol. (50,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Carbonate and hydroxide salts will precipitate. Cobalt can be concentrated 200-1000 times.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 11 ppm - based on <6.7 ppm 48 hr LC_{50} to rainbow trout for NaF[11]

Saltwater Critical Concentration: 450 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion.[11]

COBALTOUS FORMATE - $Co(CHO_2)_2 \cdot 2H_2O$

Shipping Forms: Pure

Specific Gravity: 2.129

Solubility (mg/ℓ): 50,300

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cobalt can be concentrated but is not bioconcentrative. Carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 31 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 620 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion[11]

COBALTOUS IODIDE - CoI_2

Shipping Forms: Pure

Specific Gravity: 5.68

Solubility (mg/ℓ): 1,590,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Carbonate and hydroxide salts will precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 53 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 1054 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion[11]

COBALTOUS NITRATE - $Co(NO_3)_2 \cdot 6H_2O$

Shipping Forms: Pure

Specific Gravity: 1.87

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cobalt can be concentrated 200-1000 times.[11] Carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt): 400 rabbit (low lethal dose oral)[11]

Freshwater Critical Concentration: 49 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 980 ppm based on >200 ppm minimum toxic level to mummichogs for cobalt ion[11]

COBALTOUS PERCHLORATE - $Co(ClO_4)_2.6H_2O$

Shipping Forms: Pure

Specific Gravity: 3.327

Solubility (mg/l): 1,000,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Cobalt can be concentrated 200-1000 times.[2] Carbonate and hydroxide salts are insoluble.

Mammalian Toxicity (mg/Kg body wt): 160 mouse (I.P.)[4]

Freshwater Critical Concentration: 62 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 1240 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion[4]

COBALTOUS SUCCINATE - $CoCuH_4O_4$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): Sol. (1000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Cobalt can be concentrated 200-1000 times.[2] Carbonate and hydroxide salts are insoluble

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 20 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 400 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion[4]

COBALTOUS SULFAMATE - $Co(NH_2SO_3)_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): Sol. (5000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Carbonate and hydroxide salts will precipitate. Cobalt can be concentrated 200-1000 times.[2]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 40 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 800 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion[4]

COBALTOUS SULFATE - $CoSO_4.7H_2O$

Shipping Forms: Pure

Specific Gravity: 1.988

Solubility (mg/l): 604,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cobalt can be concentrated 200-1000 times.[2] Carbonate and hydroxide salts are insoluble

Mammalian Toxicity (mg/Kg body wt): 21 mouse (I.P.)[4]

Freshwater Critical Concentration: 48 ppm - based on <10 ppm 168 hr lethal level to goldfish for cobalt ion[1]

Saltwater Critical Concentration: 960 ppm - based on >200 ppm minimum toxic level to mummichogs for cobalt ion[4]

COUMAPHOS - $C_{14}H_{16}ClO_5PS$

Shipping Forms: Pure, wettable — Specific Gravity: 1.474

Solubility (mg/ℓ): 1.5 — Vapor Pressure (mm Hg @____ °C): Negligible

Environmental Half Life: Moderately persistent

Mammalian Toxicity (mg/Kg body wt): 41 rat (oral)[88]

Freshwater Critical Concentration: .180 - 96 hr LC_{50} bluegill[88]

Saltwater Critical Concentration: .11 - 48 hr TL_m oyster larvae[89]

CRESOL - $C_6H_4OHCH_3$

Shipping Forms: Pure — Specific Gravity: 1.048

Solubility (mg/ℓ): ≤3,500 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 38% theoretical with acclimated activated sludge[39]

Mammalian Toxicity (mg/Kg body wt): 1800 (para, rat (oral)[8]

Freshwater Critical Concentration: 10 ppm - 96 hr TL_m bluegill[38]

Saltwater Critical Concentration: 55 ppm - estimated 48 hr LC_{50} shrimp[8]

CUPRIC ACETATE - $Cu(C_2H_3O_2)_2.H_2O$

Shipping Forms: Pure — Specific Gravity: 1.93

Solubility (mg/ℓ): 72,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper can be concentrated 1600 times. The hydroxide is insoluble

Mammalian Toxicity (mg/Kg body wt): 710 rat (oral)[88]

Freshwater Critical Concentration: 26 ppm - based on the 96 hr TL_m to bluegill[7]

Saltwater Critical Concentration: 5.9 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion[1]

CUPRIC ACETOARSENITE - $Cu(C_2H_3O_2)_2.3Cu(ASO_2)_2$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/ℓ): Insol. (1000) — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Does not persist in this form but results in precipitated copper and arsenate salts. Copper can be concentrated 1600 times.[39]

Mammalian Toxicity (mg/Kg body wt): 22 rat (low lethal dose oral)[88]

Freshwater Critical Concentration: 1.7 ppm - based on .43 ppm 96 hr TL_m to fathead minnor for copper ion.[37]

Saltwater Critical Concentration: 7.7 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion.[1]

CUPRIC ACETYLACETONATE - $Cu(CH_3CO\ CH\ CO\ CH_3)_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): Sol. (1000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Copper is precipitated in an oxide form. Copper can be concentrated 1600 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 1.8 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion.[1]

Saltwater Critical Concentration: 7.8 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion.[1]

CUPRIC BROMIDE - $CuBr_2$

Shipping Forms: Pure

Specific Gravity: 4.71

Solubility (mg/l): V. sol. >100,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper can be concentrated 1600 times. The hydroxide is insoluble.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 1.5 ppm - based on .43 ppm 96 hr TL_m to fathead minnows for copper ion.[1]

Saltwater Critical Concentration: 6.6 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion[1]

CUPRIC CHLORIDE - $CuCl_2.2H_2O$

Shipping Forms: Pure

Specific Gravity: 2.38

Solubility (mg/l): 1,100,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper can be concentrated 1600 times.[1] The hydroxide is insoluble.

Mammalian Toxicity (mg/Kg body wt): 140 rat (oral)[10]

Freshwater Critical Concentration: 1.1 ppm - based on .43 ppm 96 hr TL_m fathead minnows for copper ion[1]

Saltwater Critical Concentration: 5 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion.[1]

CUPRIC FORMATE - $Cu(CHO_2)_2$

Shipping Forms: Pure

Specific Gravity: 1.831

Solubility (mg/l): 125,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Copper is precipitated in an oxide form. Copper can be concentrated 1600 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 1 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion.[1]

Saltwater Critical Concentration: 5 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion[1]

CUPRIC GLUCONATE - $Cu[CH_2OH(HOH)_4COO]_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): 300,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Copper is precipitated in an oxide form. Copper can be concentrated 1600 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 3 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion[1]

Saltwater Critical Concentration: 14 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion[1]

CUPRIC GLYCINATE - $Cu(C_2H_4NO_2)_2.H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): 5700

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper is precipitated in an oxide form. Bioconcentrative copper can be concentrated 1600 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 2 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion[1]

Saltwater Critical Concentration: 7 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion[1]

CUPRIC LACTATE - $Cu(C_3H_5O_3)_2.2H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): 167,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper is precipitated in an oxide form. Copper can be concentrated 1600 times.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 2 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion[1]

Saltwater Critical Concentration: 7 ppm based on 1.9 ppm hr TL_m to oysters for copper ion[1]

CUPRIC NITRATE - $Cu(NO_3).3H_2O$

Shipping Forms: Pure

Specific Gravity: 2.32

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper can be concentrated 1600 times. The hydroxide is insoluble.[1]

Mammalian Toxicity (mg/Kg body wt): 940 rat (oral)[11]

Freshwater Critical Concentration: 2 ppm - based on .43 ppm 96 hr TL_m to fathead minnows for copper ion[1]

Saltwater Critical Concentration: 7 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion[1]

CUPRIC OXALATE - $CuC_2O_4 \cdot 4H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): 25

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper can be concentrated 1600 times. The hydroxide is insoluble.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 1.1 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion[1]

Saltwater Critical Concentration: 4.8 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion[1]

CUPRIC SUBACETATE - $Cu(C_2H_3O_2)_2 \cdot CuO \cdot 6H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): Sl. sol. (5000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper is precipitated in an oxide form. Copper can be concentrated 1600 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 1.24 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion.[1]

Saltwater Critical Concentration: 5.5 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion.[1]

CUPRIC SULFATE - $CuSO_4 \cdot 5H_2O$

Shipping Forms: Pure

Specific Gravity: 2.205

Solubility (mg/l): 316,00

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper can be concentrated 1600 times. The hydroxide is insoluble.[1]

Mammalian Toxicity (mg/Kg body wt): 300 rat (oral)[1,3]

Freshwater Critical Concentration: 8 ppm - based on 48 hr TL_m to bluegill.[1]

Saltwater Critical Concentration: 7.4 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion.[1]

CUPRIC SULFATE AMMONIATED - $[Cu(NH_3)_4]SO_4H_2O$

Shipping Forms: Pure

Specific Gravity: 1.81

Solubility (mg/l): 185,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper is precipitated in an oxide form. Copper can be concentrated 1600 times.[1]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 1.7 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion.[1]

Saltwater Critical Concentration: 7.3 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion.[1]

CUPRIC TARTRATE - $CuC_4H_4O_6.3H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): 200

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Copper is precipitated in an oxide form. Copper can be concentrated 1600 times.[17]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 1.8 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion.[17]

Saltwater Critical Concentration: 7.9 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion.[1]

CUPROUS BROMIDE - CuBr

Shipping Forms: Pure

Specific Gravity: 4.7

Solubility (mg/l): V. sl. sol. (500)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper is oxidized to cupric form and precipitates. Copper can be concentrated 1600 times.[17]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: .98 ppm - based on .43 ppm 96 hr TL_m to fathead minnow for copper ion.[17]

Saltwater Critical Concentration: 4.3 ppm - based on 1.9 ppm 96 hr TL_m to oyster for copper ion.[1]

CUPROUS IODIDE - CuI

Shipping Forms: Pure

Specific Gravity: 5.63

Solubility (mg/l): 8

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Copper can be concentrated 1600 times. The hydroxide is insoluble.[17]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 1.27 ppm - based on .43 ppm 96 hr TL_m to fathead minnows for copper ion.[17]

Saltwater Critical Concentration: 5.6 ppm - based on 1.9 ppm 96 hr TL_m to oysters for copper ion.[1]

CYANOGEN CHLORIDE - CnCl

Shipping Forms: Pure

Specific Gravity: 1.2

Solubility (mg/l): >2500

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Oxidizes with time

Mammalian Toxicity (mg/Kg body wt): 39 mouse (low lethal dose subcutaneous)[18]

Freshwater Critical Concentration: .08 ppm - lethal to fish.[1]

Saltwater Critical Concentration: .08 ppm - approximated from freshwater data

CYCLOHEXANE - C_6H_{12}

Shipping Forms: Pure

Specific Gravity: 0.779

Solubility (mg/ℓ): 45

Vapor Pressure (mm Hg @ 7.5 °C): 44

Environmental Half Life: Volatile

Mammalian Toxicity (mg/Kg body wt): 29,820 rat (oral)[1]

Freshwater Critical Concentration: 31 ppm - 96 hr TL_m bluegill.[1,4]

Saltwater Critical Concentration: 31 ppm - approximated from freshwater data

2,4-D ACID - $C_8H_6Cl_2O_3$

Shipping Forms: Pure, wettable

Specific Gravity: >1.0

Solubility (mg/ℓ): 620

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Degrades rapidly. Reversably concentrated by a factor of 180.[1,4]

Mammalian Toxicity (mg/Kg body wt): 100 rat (oral)[1,4]

Freshwater Critical Concentration: 350 ppm - 24 hr TL_m to bluegill for pure acid[1]
8 ppm - 48 hr TL_m to bluegill for wettable form[1,4]

Saltwater Critical Concentration: 6 ppm based on 8 ppm 48 hr TL_m to oysters for ester form[1]

2,4-D ESTERS - $C_8H_6Cl_2O_3$ester

Shipping Forms: Pure, wettable

Specific Gravity: >1.0

Solubility (mg/ℓ): 100-1000

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: 2,4-D esters degrade rapidly but may concentrate in organism by a factor of 180[1,4]

Mammalian Toxicity (mg/Kg body wt): 320 rat (oral)[1,4]

Freshwater Critical Concentration: 2.0 ppm - based on 96 hr TL_m to fingerling striped bass for the butyl ester[1,4]

Saltwater Critical Concentration: 8 ppm - 48 hr TL_m to oyster[1,4]

DALAPON - $CH_3-\overset{Cl}{\underset{Cl}{C}}-\overset{O}{\overset{\|}{C}}-OH$ CH_3CCl_2COOH

Shipping Forms: Pure, wettable

Specific Gravity: 1.389

Solubility (mg/ℓ): 450,000

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Greater than 10 days[1,4]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 105 ppm - 96 hr LC_{50} bluegill[1,4]

Saltwater Critical Concentration: 1 ppm - 48 hr LC_{40} brown shrimp[1,4]

DDT - $C_{14}H_9Cl_5$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/ℓ): .01 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Very stable, bioconcentrates in oysters up to 70,000 times[9]

Mammalian Toxicity (mg/Kg body wt): 250 rat (oral)[1]

Freshwater Critical Concentration: .0095 ppm - 96 hr TL_m to bluegill[9]

Saltwater Critical Concentration: .03 ppm - 96 hr EC_{50} to oyster[10]

DIAZINON - $C_{12}H_{21}N_2O_3PS$

Shipping Forms: Pure, wettable — Specific Gravity: 1.116

Solubility (mg/ℓ): 40 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Degrades relatively fast. May concentrate up to 10 times.[9]

Mammalian Toxicity (mg/Kg body wt): 357 man(oral)[1]

Freshwater Critical Concentration: .022 ppm - 96 hr TL_m bluegill[9]

Saltwater Critical Concentration: .022 ppm - based on freshwater levels

DICAMBA - $O_3C_{12}C_8H_6$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

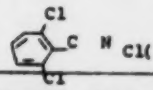
Solubility (mg/ℓ): 4500 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persistent

Mammalian Toxicity (mg/Kg body wt): 1040 rat (oral)[9]

Freshwater Critical Concentration: 40 ppm - 48 hr TL_m bluegill[9]

Saltwater Critical Concentration: 40 ppm - based on freshwater toxicity

DICHLOBENIL  $Cl(Cl)C_6H_3CN$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/ℓ): 18 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persistant

Mammalian Toxicity (mg/Kg body wt): 3160 rat (oral)[9]

Freshwater Critical Concentration: 14.7 ppm - 96 hr TL_m bluegill[9,11]

Saltwater Critical Concentration: 14.7 ppm - based on freshwater data

DICHLONE - $C_{10}H_4Cl_2O_2$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/l): 0.1 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persistent

Mammalian Toxicity (mg/Kg body wt): 1300 rat (oral)[99]

Freshwater Critical Concentration: .04 ppm - 96 hr LC_{50} bluegill[99]

Saltwater Critical Concentration: .04 ppm - based on freshwater toxicity

DICHLORVOS - $(CH_3O)_2$ P(O) OCH: CCl_2

Shipping Forms: Pure, wettable — Specific Gravity: 1.44

Solubility (mg/l): 10,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persistent to 62 days

Mammalian Toxicity (mg/Kg body wt): 56 rat (oral)[99]

Freshwater Critical Concentration: 0.7 ppm - 48 hr bluegill[99]

Saltwater Critical Concentration: 0.39 ppm - 24 hr LC_{50} to grass shrimp[99]

DIELDRIN - $C_{12}H_8Cl_6O$

Shipping Forms: Pure, wettable — Specific Gravity: 1.75

Solubility (mg/l): Insol. (.186) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Bioconcentrated in oysters to 8000 times ambient levels [99]

Mammalian Toxicity (mg/Kg body wt): 46 rat (oral)[99]

Freshwater Critical Concentration: .0079 ppm - 96 hr TL_m bluegill[99]

Saltwater Critical Concentration: .05 ppm - 96 hr LC_{50} grass shrimp[99]

DIETHYLAMINE - $(C_2H_5)_2NH$

Shipping Forms: Pure — Specific Gravity: 0.71

Solubility (mg/l): 815,000 — Vapor Pressure (mm Hg @ 7.5 °C): 760

Environmental Half Life: Degrades at a moderate rate - assume BOD_5 of 10% theoretical

Mammalian Toxicity (mg/Kg body wt): 540 rat (oral)[7]

Freshwater Critical Concentration: 85 ppm - 48 hr TL_m creek chub[7]

Saltwater Critical Concentration: 85 ppm - approximated from freshwater data

DIMETHYLAMINE - $(CH_3)_2NH$

Shipping Forms: 25%, 40%, and Anhydrous — Specific Gravity: 0.68

Solubility (mg/l): V. sol. (>100,000) — Vapor Pressure (mm Hg @ 7.5 °C): 760

Environmental Half Life: Degrades slowly

Mammalian Toxicity (mg/Kg body wt): 540 rat (oral)[7]

Freshwater Critical Concentration: 85 ppm - 48 hr TL_m creek chub[7]

Saltwater Critical Concentration: 100 ppm - based on >100 ppm 48 hr LC_{50} for shrimp[8]

DINITROPHENOL - $C_6H_4N_2O_5$

Shipping Forms: Pure — Specific Gravity: 1.68

Solubility (mg/l): 13,200 — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: BOD .94-7.7% theoretical[2]

Mammalian Toxicity (mg/Kg body wt): 30 rat (oral)[1,9]

Freshwater Critical Concentration: 35 ppm - minnows overturn in 6 hours when exposed to 35-38 ppm[1]

Saltwater Critical Concentration: 35 ppm - approximated from freshwater data

DIQUAT - $C_{12}H_{12}Br_2N_2$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/l): 700,000 — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Persisted 7-27 days at 2.5 ppm[10]

Mammalian Toxicity (mg/Kg body wt): 321 rat (oral)[10]

Freshwater Critical Concentration: 35 ppm - 96 hr TL_m - bluegill[10]

Saltwater Critical Concentration: 10 ppm - based on >10 ppm 48 hr LC_{50} to shrimp[10]

DISULFOTON - $(C_2H_5O)_2P(S)SCH_2CH_2SCH_2CH_3$

Shipping Forms: Pure, wettable — Specific Gravity: 1.144

Solubility (mg/l): 25 — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Persists 4 weeks in soil

Mammalian Toxicity (mg/Kg body wt): 10 rat (oral)[10]

Freshwater Critical Concentration: .064 ppm - 96 hr LC_{50} - bluegill[11]

Saltwater Critical Concentration: .064 ppm - approximated from freshwater data

DIURON - $C_9H_{10}Cl_2N_2O$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/l): 42 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Relatively persistent

Mammalian Toxicity (mg/Kg body wt): 437 rat (oral)[88]

Freshwater Critical Concentration: 4.0 ppm - 96 hr LC_{50} - bluegill[91]

Saltwater Critical Concentration: 1.8 ppm - 96 hr EC_{50} - oyster[88]

DODECYLBENZENESULFONIC ACID - $O_3SC_{18}H_{30}$

Shipping Forms: Pure — Specific Gravity: >10

Solubility (mg/l): Sol. (50,000) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 43% theoretical with activated sludge based on sodium salt[91]

Mammalian Toxicity (mg/Kg body wt): 95 mouse (oral)[88]

Freshwater Critical Concentration: 18 ppm - based on 19 ppm - 96 hr TL_m to bluegill for sodium salt[79]

Saltwater Critical Concentration: 9 ppm - based on 10.1 ppm - 96 hr TL_m to mullet for sodium salt[79]

DURSBAN - $C_9H_{11}Cl_3NO_3PS$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/l): 2 — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Moderate persistence

Mammalian Toxicity (mg/Kg body wt): 145 rat (oral)[88]

Freshwater Critical Concentration: .037 ppm - 36 hr LC_{50} - green sunfish[34]

Saltwater Critical Concentration: .04 ppm - approximated from freshwater data

ENDOSULFAN - $C_9H_6Cl_6O_3S$

Shipping Forms: Pure, wettable — Specific Gravity: 1.745

Solubility (mg/l): Insol. (1) — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Moderately persistent

Mammalian Toxicity (mg/Kg body wt): 100 rat (oral)[88]

Freshwater Critical Concentration: .0033 ppm - 96 hr LC_{50} - fathead minnow[111]

Saltwater Critical Concentration: .01 ppm - 48 hr LC_{50} - prawn[33]

ENDRIN - $C_{12}H_8Cl_6O$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/l): 0.23 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydrolyses slowly- bioconcentrated by a factor of 1,000-10,000 in oysters and fish[17]

Mammalian Toxicity (mg/Kg body wt): 7.3 rat (oral)[1]

Freshwater Critical Concentration: .0006 ppm - 96 hr TL_m - bluegill[1]

Saltwater Critical Concentration: .0031 - 96 hr TL_m - puffer fish[18]

ETHION - $C_9H_{22}O_4P_2S_4$

Shipping Forms: Pure, wettable — Specific Gravity: 1.215

Solubility (mg/l): 1 — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Moderate persistence

Mammalian Toxicity (mg/Kg body wt): 13 rat (oral)[18]

Freshwater Critical Concentration: 0.13 ppm - 96 hr TL_m - bluegill[14]

Saltwater Critical Concentration: 0.13 ppm - approximated from freshwater data

ETHYLBENZENE - $C_6H_4C_2H_5$

Shipping Forms: Pure — Specific Gravity: 0.958

Solubility (mg/l): 14 — Vapor Pressure (mm Hg @ 7.5 °C): 3.50

Environmental Half Life: BOD_5 - 28% theoretical with activated sewage seed[14]

Mammalian Toxicity (mg/Kg body wt): 3500 rat (oral)[18]

Freshwater Critical Concentration: 29 ppm - 96 hr TL_m bluegill[14]

Saltwater Critical Concentration: 29 ppm - approximated from freshwater data

ETHYLENEDIAMINE - $C_2H_8N_2$

Shipping Forms: 91 - 93% — Specific Gravity: 0.898

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @ 7.5 °C): 4.5

Environmental Half Life: BOD_5 - 75% theoretical[18] - 24% in freshwater and 2% in salt[4]

Mammalian Toxicity (mg/Kg body wt): 1160 rat (oral)[18]

Freshwater Critical Concentration: 30 ppm - lower 24 hr critical range creek chub[1]

Saltwater Critical Concentration: 14 ppm - 24 hr TL_m brine shrimp[4]

EDTA - $C_{10}H_{16}N_2O_8$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/ℓ): 500 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - .01 lb/lb (.5% theoretical)[88]

Mammalian Toxicity (mg/Kg body wt): 104 rat (oral)[113]

Freshwater Critical Concentration: 500 ppm - estimated 72 hr TL_m to fathead minnow[9]

Saltwater Critical Concentration: 500 ppm - approximated from freshwater data

FERRIC AMMONIUM CITRATE - $(FeNH_4)_3(C_6H_5O_7)_4$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/ℓ): >1,000,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Iron precipitates while the ammonium citrate is biodegradable

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 24 ppm - based on 4.0 ppm - 96 hr LC_{50} to striped bass for iron ion[11]

Saltwater Critical Concentration: 48 ppm - based on 39 ppm - 48 hr LC_{50} to prawn for ferric chloride[9]

FERRIC CHLORIDE - $FeCl_3.6H_2O$

Shipping Forms: Pure 30-50% — Specific Gravity: 2.9

Solubility (mg/ℓ): 919,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide salt precipitates

Mammalian Toxicity (mg/Kg body wt): 900 rat (oral)[113]

Freshwater Critical Concentration: 20 ppm - based on 4.0 ppm - 96 hr LC_{50} to striped bass[9] for iron ion[11]

Saltwater Critical Concentration: 39 ppm - 48 hr LC_{50} prawn[9]

FERRIC FLUORIDE - $FeF_3.4\frac{1}{2}H_2O$

Shipping Forms: Pure — Specific Gravity: 3.87

Solubility (mg/ℓ): Sl. sol. (5,000) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Iron is precipitated as an hydroxide salt

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 11 ppm based on 6.7 ppm 48 hr LC_{50} to rainbow trout for iron NaF[11]

Saltwater Critical Concentration: 28 ppm - based on 39 ppm - 48 hr LC_{50} to prawn for ferric chloride[9]

FERRIC NITRATE - $Fe(NO_3)_3.9H_2O$

Shipping Forms: Pure — Specific Gravity: 1.684

Solubility (mg/ℓ): Sol. (50,000) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide salt precipitates. Iron is accumulated but is not bioconcentrative

Mammalian Toxicity (mg/Kg body wt): 3250 rat (oral)[11]

Freshwater Critical Concentration: 30 ppm - based on 4.0 ppm - 96 hr LC_{50} to striped bass for iron ion[11]

Saltwater Critical Concentration: 60 ppm - based on 39 ppm - 48 hr LC_{50} to prawn for ferric chloride[4]

FERRIC PHOSPHATE - $FePO_4.2H_2O$

Shipping Forms: Pure — Specific Gravity: 2.87

Solubility (mg/ℓ): Insol. (500) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Iron will precipitate as hydroxide

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 14 ppm - based on 4 ppm - 96 hr LC_{50} to striped bass for iron[11]

Saltwater Critical Concentration: 28 ppm - based on 39 ppm - 48 hr LC_{50} to prawn for ferric chloride[4]

FERRIC SULFATE - $Fe_2(SO_4)_3.9H_2O$

Shipping Forms: Pure — Specific Gravity: 2.1

Solubility (mg/ℓ): 4,400,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Iron may be precipitated

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 20 ppm - based on 4 ppm - 96 hr LC_{50} to striped bass for iron ion[11]

Saltwater Critical Concentration: 40 ppm - based on 39 ppm - 48 hr LC_{50} to prawn for ferric chloride[4]

FERROUS AMMONIUM SULFATE - $FeSO_4.(NH_4)_2SO_4.$

Shipping Forms: Pure — Specific Gravity: 1.864

Solubility (mg/ℓ): 180,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide salt precipitates. Iron is accumulated but is not bioconcentrative.

Mammalian Toxicity (mg/Kg body wt): 3250 rat (oral)[11]

Freshwater Critical Concentration: 20 ppm - based on 4.0 ppm 96 hr LC_{50} to striped bass for iron ion[11]

Saltwater Critical Concentration: 40 ppm - based on 39 ppm 48 hr LC_{50} to prawn for ferric chloride[4]

FERROUS CHLORIDE - $FeCl_2 \cdot 4H_2O$

Shipping Forms: Pure — Specific Gravity: 1.93

Solubility (mg/ℓ): 1,600,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Iron may be precipitated. It accumulates but is not bioconcentrative.

Mammalian Toxicity (mg/Kg body wt): 984 rat (oral)[99]

Freshwater Critical Concentration: for iron ion[81] — 14 ppm - based on 4 ppm 96 hr LC_{50} to striped bass

Saltwater Critical Concentration: for ferric chloride[8] — 28 ppm - based on 39 ppm 48 hr LC_{50} to prawn

FERROUS OXALATE - $FeC_2O_4 \cdot 2H_2O$

Shipping Forms: Pure — Specific Gravity: 2.28

Solubility (mg/ℓ): 220 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide salt precipitates.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: striped bass for iron ion[81] — 13 ppm - based on 4.0 ppm - 96 hr LC_{50} to

Saltwater Critical Concentration: prawn for ferric chloride[8] — 26 ppm - based on 39 ppm - 48 hr LC_{50} to

FERROUS SULFATE - $FeSO_4 \cdot 7H_2O$

Shipping Forms: Pure — Specific Gravity: 1.899

Solubility (mg/ℓ): 156,500 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Iron is precipitated to low levels.

Mammalian Toxicity (mg/Kg body wt): 5,000 rat (oral)[100]

Freshwater Critical Concentration: striped bass for iron ion[81] — 20 ppm - based on 4 ppm - 96 hr LC_{50} to

Saltwater Critical Concentration: prawn for ferric chloride[8] — 40 ppm - based on 39 ppm - 48 hr LC_{50} to

FORMALDEHYDE - CH_2O

Shipping Forms: 37% with 12-15% methanol, 37% with 7% methanol, and 44% with 1% methanol and 37% methanol free — Specific Gravity: 0.815

Solubility (mg/ℓ): >1,000,000 — Vapor Pressure (mm Hg @ 7.5 °C): >760

Environmental Half Life: BOD_5 - 99% theoretical with activated sludge[1]

Mammalian Toxicity (mg/Kg body wt): 800 rat (oral)[1]

Freshwater Critical Concentration: 25 ppm - 96 hr TL_m channel catfish[7]

Saltwater Critical Concentration: 215 ppm - estimated 48 hr LC_{50} to flounder[8]

FORMIC ACID - HCOOH

Shipping Forms: 85%, 90%

Specific Gravity: 1.22

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @ 7.5 °C): 14

Environmental Half Life: BOD_5 - 40% theoretical in quiescent state, 48% in freshwater and 62% in salt water[2,4,5]

Mammalian Toxicity (mg/Kg body wt): 4,000

Freshwater Critical Concentration: 175 ppm - 24 hr TL_m bluegill[7]

Saltwater Critical Concentration: 85 ppm - estimated 48 hr LC_{50} to shore crabs[21]

FUMARIC ACID - $C_4H_4O_4$

Shipping Forms: Pure

Specific Gravity: 1.635

Solubility (mg/ℓ): 7,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - .65 lb/lb (78% theoretical)[21]

Mammalian Toxicity (mg/Kg body wt): 200 mice (I.P.)[99]

Freshwater Critical Concentration: 138 ppm - 48 hr TL_m bluegill[1]

Saltwater Critical Concentration: 138 ppm - approximated from freshwater data

FURFURAL - $C_5H_4O_2$

Shipping Forms: Pure

Specific Gravity: 1.15

Solubility (mg/ℓ): 83,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 0.53 lb/lb (32% theoretical) with sewage seed[21]

Mammalian Toxicity (mg/Kg body wt): 100 - 199 mammal (oral)[7]

Freshwater Critical Concentration: 24 ppm - 96 hr TL_m bluegill[7]

Saltwater Critical Concentration: 24 ppm - approximated from freshwater data

GUTHION - $C_{10}H_{12}N_3O_3PS_2$

Shipping Forms: Pure, wettable

Specific Gravity: 1.44

Solubility (mg/ℓ): 33

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Organophosphorous insecticides are generally degradable.

Mammalian Toxicity (mg/Kg body wt): 20 rat (oral)[114]

Freshwater Critical Concentration: .03 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: .01 ppm .01 ppm - 24 hr sublethal effects on sheephead minnow[133]

HEPTACHLOR - $C_{10}H_5Cl_7$

Shipping Forms: Pure, wettable — Specific Gravity: 1.58

Solubility (mg/ℓ): Insol. (.056) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Bioconcentrative to 17,600 times in oyster and 300 times in bluegill[1]

Mammalian Toxicity (mg/Kg body wt): 90 rat (oral)[11]

Freshwater Critical Concentration: .019 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 0.7 ppm - 96 hr TL_m brown shrimp[11]

HYDROCHLORIC ACID - HCl

Shipping Forms: Anhydrous, 18, 20, and 22 Be — Specific Gravity: 1.63

Solubility (mg/ℓ): 1,000,000 — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Neutralizes with dilution

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 46 ppm - 96 hr TL_m bluegill at 10^{-3} alkalinity[1]

Saltwater Critical Concentration: 215 ppm - 48 hr LC_{50} shrimp[8]

HYDROFLUORIC ACID - HF

Shipping Forms: Anhydrous, 70% — Specific Gravity: .0093 as gas

Solubility (mg/ℓ): < 1,000,000 — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Neutralizes with dilution. Fluoride may be precipitated by calcium ions.

Mammalian Toxicity (mg/Kg body wt): 80 guinea pig (oral)[11]

Freshwater Critical Concentration: 3.1 ppm - based on 48 hr LC_{50} to rainbow trout for HaF[12]

Saltwater Critical Concentration for acidity[8]: 120 ppm - based on 48 hr LC_{50} to shrimp

HYDROGEN CYANIDE - HCN

Shipping Forms: 98% — Specific Gravity: 0.6884 as liquid

Solubility (mg/ℓ): High (50,000) — Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Cyanide is oxidized to less toxic cyanate.

Mammalian Toxicity (mg/Kg body wt): 4 mouse (oral)[11]

Freshwater Critical Concentration: 0.18 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration to prawn for HCN[8]: 0.10 ppm - based on .25 ppm 48 hr LC_{50}

HYDROQUINONE - $C_6H_6O_2$

Shipping Forms: Pure — Specific Gravity: 1.328

Solubility (mg/l): 67,000 — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: BOD_5 - 53% theoretical[13]

Mammalian Toxicity (mg/Kg body wt): 320 rat (oral)[1]

Freshwater Critical Concentration: 5 ppm - 96 hr TL_m fathead minnow[9]

Saltwater Critical Concentration: 5 ppm - approximated from freshwater data

HYDROXYLAMINE - NH_2OH

Shipping Forms: Pure — Specific Gravity: 1.2

Solubility (mg/l): V. sol. (100,000) — Vapor Pressure (mm Hg @ 47.2 °C): 10

Environmental Half Life: Rapidly decomposes under alkaline conditions.

Mammalian Toxicity (mg/Kg body wt): 200 - 800 rat (oral)[11,8]

Freshwater Critical Concentration: 150 ppm - 10 minutes till death for rainbow trout[1]

Saltwater Critical Concentration: 150 ppm - approximated from freshwater data

ISOPRENE - C_5H_8

Shipping Forms: Pure — Specific Gravity: 0.681

Solubility (mg/l): Sl. Sol. (100) — Vapor Pressure (mm Hg @ 7.5 °C): 300

Environmental Half Life: Degrades in time

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 75 ppm - 96 hr TL_m fathead minnow[11]

Saltwater Critical Concentration: 75 ppm - approximated from freshwater data

ISOPROPANOLAMINE DODECYLBENZENESULFONATE - $(O_3SC_{18}H_{30})(CH_3CH(OH)CH_2NH_3$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/l): Sol. (100,000) — Vapor Pressure (mm Hg @ _____ °C):

Environmental Half Life: BOD ~ 43% theoritical based on data for sodium salt [21]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 21 ppm - based on 19 ppm 96 hr TL_m to bluegill for sodium salt[19]

Saltwater Critical Concentration: 12 ppm - based on 10.1 ppm 96 hr TL_m to mullet for sodium salt[19]

KELTHANE - 1, 1-bis(P-chlorophenyl)-2,2,2-trichloroethanol

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/l): Insol. (500) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persistent

Mammalian Toxicity (mg/Kg body wt): 1100 rat (oral)[111]

Freshwater Critical Concentration: 100 ppm - 48 hr LC_{50} rainbow trout[1]

Saltwater Critical Concentration: 100 ppm - approximated from freshwater data

LEAD ACETATE - $Pb(C_2H_3O_2)_2.3H_2O$

Shipping Forms: Pure — Specific Gravity: 2.25

Solubility (mg/l): 433,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate

Mammalian Toxicity (mg/Kg body wt): 1000 - 10,000 rat (oral)[111]

Freshwater Critical Concentration: 127 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[11]

Saltwater Critical Concentration: 429 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[4]

LEAD BROMIDE - $PbBr_2$

Shipping Forms: Pure — Specific Gravity: 6.66

Solubility (mg/l): 4554 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 127 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[11]

Saltwater Critical Concentration: 417 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$

LEAD CHLORIDE - $PbCl_2$

Shipping Forms: Pure — Specific Gravity: 5.85

Solubility (mg/l): 9900 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt): 2000 guinea pig (low lethal dose oral)[11]

Freshwater Critical Concentration: 442 ppm - 96 hr TL_m bluegill[11]

Saltwater Critical Concentration: 315 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$

LEAD FLUOBORATE - $Pb(BF_4)_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): Sol.

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt): 50 rat (low lethal dose oral)[44]

Freshwater Critical Concentration: 127 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[44]

Saltwater Critical Concentration: 432 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[6]

LEAD FLUORIDE

Shipping Forms: Pure

Specific Gravity: 8.24

Solubility (mg/ℓ): 640

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt): 4000 guinea pig (low lethal dose oral)[44]

Freshwater Critical Concentration: 19 ppm - based on 6.7 ppm 48 hr LC_{50} to rainbow trout for NaF[43]

Saltwater Critical Concentration: 278 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[6]

LEAD IODIDE

Shipping Forms: Pure

Specific Gravity: 6.16

Solubility (mg/ℓ): 640

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 150 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[44]

Saltwater Critical Concentration: 522 ppm - based on 375 ppm 58 hr LC_{50} to prawn for $Pb(NO_3)_2$[6]

LEAD NITRATE

Shipping Forms: Pure

Specific Gravity: 4.53

Solubility (mg/ℓ): 376,500

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt): 1000 - 10,000 rat (oral)[117]

Freshwater Critical Concentration: 115 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[44]

Saltwater Critical Concentration: 375 ppm - 48 hr LC_{50} to prawn[6]

LEAD STEARATE

Shipping Forms: Pure

Specific Gravity: 1.4

Solubility (mg/l): 50

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt): 20,000 guinea pig (MLD-oral)[9]

Freshwater Critical Concentration: 253 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[5]

Saltwater Critical Concentration: 877 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[8]

LEAD SULFATE - $PbSO_4$

Shipping Forms: Pure

Specific Gravity: 6.2

Solubility (mg/l): 425

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is bioconcentrative metal. The carbonate and hydroxide salts will precipitate

Mammalian Toxicity (mg/Kg body wt): 300 guinea pig (I.P.)[9]

Freshwater Critical Concentration: 101 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead ion[5]

Saltwater Critical Concentration: 343 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[8]

LEAD SULFIDE - PbS

Shipping Forms: Pure

Specific Gravity: 7.5

Solubility (mg/l): .86

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt): 1600 rat (I.P.)[9]

Freshwater Critical Concentration: 81 ppm - based on 69 ppm 9 hr TL_m to bluegill for lead cation[5]

Saltwater Critical Concentration: 270 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[8]

LEAD TETRACETATE - $Pb(C_2H_3O_2)_4$

Shipping Forms: Pure

Specific Gravity: 2.28

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 147 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[5]

Saltwater Critical Concentration: 502 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[8]

LEAD THIOCYANATE - $Pb(SCN)_2$

Shipping Forms: Pure

Specific Gravity: 3.82

Solubility (mg/ℓ): 500

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 108 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[11]

Saltwater Critical Concentration: 366 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[1]

LEAD THIOSULFATE - PbS_2O_3

Shipping Forms: Pure

Specific Gravity: 5.18

Solubility (mg/ℓ): 300

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 107 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[11]

Saltwater Critical Concentration: 360 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[1]

LEAD TUNGSTATE - $PbWO_4$

Shipping Forms: Pure

Specific Gravity: 8.46

Solubility (mg/ℓ): 300

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Lead is a bioconcentrative metal. The carbonate and hydroxide salts will precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 150 ppm - based on 69 ppm 96 hr TL_m to bluegill for lead cation[11]

Saltwater Critical Concentration: 515 ppm - based on 375 ppm 48 hr LC_{50} to prawn for $Pb(NO_3)_2$[1]

LINDANE - $C_6H_6Cl_6$

Shipping Forms: Pure, wettable

Specific Gravity: 1.87

Solubility (mg/ℓ): 10

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Persistant, bioconcentrative[11]

Mammalian Toxicity (mg/Kg body wt): 76 rat (oral)[11]

Freshwater Critical Concentration: .077 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: .36 ppm - 96 hr LC_{50} oyster [1]

LITHIUM BICHROMATE - $Li_2Cr_2O_7.2H_2O$

Shipping Forms: Pure

Specific Gravity: 2.34

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Chromate will remain dissolved until reduced to trivalent form. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 190 ppm - based on 213 ppm 48 hr TL_m to bluegill for sodium bichromate[1]

Saltwater Critical Concentration: 133 ppm - based on critical concentration for sodium bichromate

LITHIUM CHROMATE - $Li_2CrO_4.2H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Chromate will remain dissolved until reduced to trivalent form. Chromium can be concentrated by a factor of 2000.[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 146 ppm - based on 300 ppm 24 hr TL_m to bluegill for sodium chromate [1]

Saltwater Critical Concentration: 166 ppm - based on critical concentration for sodium chromate

LITHIUM FLUORIDE - LiF

Shipping Forms: Pure

Specific Gravity: 2.601

Solubility (mg/ℓ): 2700

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Fluoride will precipitate as calcium salt.

Mammalian Toxicity (mg/Kg body wt): 200 guinea pig (oral)[11]

Freshwater Critical Concentration: 4 ppm - based on 6.7 ppm 48 hr LC_{50} to rainbow trout for NaF[11]

Saltwater Critical Concentration: 186 ppm - based on >300 ppm 48 hr LC_{50} and prawn for NaF[11]

MALATHION - $C_{10}H_{19}O_6PS_2$

Shipping Forms: Pure, wettable

Specific Gravity: 1.23

Solubility (mg/ℓ): 145

Vapor Pressure (mm Hg @ 0.7 °C):

Environmental Half Life: Hydrolyzes rapidly, however, toxicity remained after 14 days in solution[11]

Mammalian Toxicity (mg/Kg body wt): 1000 rat (oral)[1]

Freshwater Critical Concentration: .115 ppm - 96 hr TL_m bluegill[11]

Saltwater Critical Concentration: .033 ppm - 96 hr LC_{50} marine crustacea[11]

MALEIC ACID - $C_4H_4O_4$

Shipping Forms: Pure

Specific Gravity: 1.59

Solubility (mg/ℓ): V. Sol. (100,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - .63 lb/lb (76% theoretical) with acclimated seed[10]

Mammalian Toxicity (mg/Kg body wt): 850 rat (oral)[11]

Freshwater Critical Concentration: 138 ppm - 48 hr TL_m bluegill[1]

Saltwater Critical Concentration: 138 ppm - approximated from freshwater data

MALEIC ANHYDRIDE - $C_4H_2O_3$

Shipping Forms: Pure, molten

Specific Gravity: 0.734

Solubility (mg/ℓ): 163,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: BOD_5 - .63 lb/lb (76% theoretical) with acclimated seed - based on that for the acid[10]

Mammalian Toxicity (mg/Kg body wt): 850 rat (oral)[11]

Freshwater Critical Concentration: 117 ppm - based on 138 ppm 48 hr TL_m bluegill for maleic acid[1]

Saltwater Critical Concentration: 117 ppm - approximated from freshwater data

MERCURIC ACETATE - $Hg(C_2H_3O_2)_2$

Shipping Forms: Pure

Specific Gravity: 3.28

Solubility (mg/ℓ): 250,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Mercury is bioconcentrative to 10,000 times ambient levels[10] Mercury enters biochemical recycling system regardless of initial chemical form.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 0.48 ppm - based on 0.3 ppm 96 hr LC_{50} to pumpkinseed for mercury ion[10]

Saltwater Critical Concentration: 0.32 ppm - based on 0.21 ppm estimated 96 hr LC_{50} shrimp for mercury ion[10]

MERCURIC CHLORIDE - $HgCl_2$

Shipping Forms: Pure

Specific Gravity: 5.44

Solubility (mg/ℓ): 36,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Mercury is bioconcentrative to 10,000 times ambient levels[10] Mercury enters biochemical recycling system regardless of initial chemical form.

Mammalian Toxicity (mg/Kg body wt): 1 human (low lethal dose oral)[10]

Freshwater Critical Concentration: 0.41 ppm - based on 0.3 ppm 96 hr LC_{50} to pumpkinseed for mercury ion[10]

Saltwater Critical Concentration: 0.28 ppm - based on 0.21 ppm estimated 96 hr LC_{50} to shrimp for mercury[10]

MERCURIC NITRATE - $Hg(NO_3)_2.H_2O$

Shipping Forms: Pure

Specific Gravity: 4.39

Solubility (mg/ℓ): V. Sol. (100,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Mercury is bioconcentrative to 10,000 times ambient levels[11] Mercury enters biochemical recycling system regardless of initial chemical form.

Mammalian Toxicity (mg/Kg body wt): 5 rat (I.P.)[11]

Freshwater Critical Concentration: 0.51 ppm - based on 0.3 ppm 96 hr LC_{50} to pumpkinseed for mercury ion[11]

Saltwater Critical Concentration: 0.34 ppm - based on 0.21 ppm estimated 96 hr LC_{50} to shrimp for mercury ion[11]

MERCURIC OXIDE - HgO

Shipping Forms: Pure

Specific Gravity: 11.14

Solubility (mg/ℓ): 52

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Mercury is bioconcentrative to 10,000 times ambient levels[11] Mercury enters biochemical recycling system regardless of initial chemical form.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 0.32 ppm - based on 0.3 ppm 96 hr LC_{50} to pumpkinseed for mercury ion[11]

Saltwater Critical Concentration: 0.22 ppm - based on 0.21 ppm estimated 96 hr LC_{50} to shrimp for mercury ion[11]

MERCURIC SULFATE - $HgSO_4$

Shipping Forms: Pure

Specific Gravity: 6.47

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Deconposes to H_2SO_4 and mercuric precipitate. Mercury is bioconcentrative to 10,000 times ambient levels[11] Mercury enters biochemical recycling system regardless of initial chemical form.

Mammalian Toxicity (mg/Kg body wt): 57 rat (oral) (U. S. Air Force - Dept. of Transportation)

Freshwater Critical Concentration: .44 ppm - based on 0.3 ppm 96 hr LC_{50} to pumpkinseed for mercury ion[11]

Saltwater Critical Concentration: .31 ppm - based on 0.21 ppm estimated 96 hr LC_{50} to shrimp for mercury ion[11]

MERCURIC THIOCYANATE - $Hg(SCN)_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): 700

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Mercury is bioconcentrative to 10,000 times ambient levels[11] Mercury enters biochemical recycling system regardless of initial chemical form.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: .47 ppm - based on 0.3 ppm 96 hr LC_{50} to pumpkinseed for mercury ion[11]

Saltwater Critical Concentration: .33 ppm - based on 0.21 ppm estimated 96 hr LC_{50} to shrimp for mercury ion[11]

MERCUROUS NITRATE - $Hg_2(NO_3)_2 \cdot 2H_2)$

Shipping Forms: Pure — Specific Gravity: 4.79

Solubility (mg/ℓ): Decomposes — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Decomposes to basic salt, H_gO is soluble to .1 ppm Mercury is bioconcentrative to 10,000 times ambient levels[58]

Mammalian Toxicity (mg/Kg body wt): 4 mice (I.P.)[58]

Freshwater Critical Concentration: .42 ppm - based on 0.3 ppm - 96 hr LC_{50} to pumpkinseed for mercury ion[59]

Saltwater Critical Concentration: .29 ppm - based on 0.21 ppm estimated 96 hr LC_{50} to shrimp for mercury ion[59]

METHOXYCHLOR - $C_{16}H_{15}Cl_3O_2$

Shipping Forms: Pure, wettable — Specific Gravity: 1.41

Solubility (mg/ℓ): Sl. (0.1) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Somewhat persistent

Mammalian Toxicity (mg/Kg body wt): 5,000 rat (oral)[1]

Freshwater Critical Concentration: 0.062 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 0.08 ppm - 96 hr TL_m marine fish[60]

METHYL MERCAPTAN - CH_3SH

Shipping Forms: Pure — Specific Gravity: 0.867

Solubility (mg/ℓ): Sl. Sol. 23,300 — Vapor Pressure (mm Hg @ 7.5 °C): 760

Environmental Half Life: Decomposes slowly in water through hydrolysis

Mammalian Toxicity (mg/Kg body wt): 2.4 mice (subcutaneous)[58]

Freshwater Critical Concentration: 1 ppm - 6 hr lethal to bluegill[1]

Saltwater Critical Concentration: 1 ppm - approximated from freshwater data

METHYL METHACRYLATE - $C_3H_5COOCH_3$

Shipping Forms: Pure — Specific Gravity: 0.936

Solubility (mg/ℓ): Sl. Sol. 1,000 — Vapor Pressure (mm Hg @ 7.5 °C): 17

Environmental Half Life: BOD_{10} - 47% theoretical with sewage seed[1]

Mammalian Toxicity (mg/Kg body wt): 9400 rat (oral)[7]

Freshwater Critical Concentration: 250 ppm - 96 hr TL_m bluegill[14]

Saltwater Critical Concentration: 250 ppm - approximated from freshwater data

METHYL PARATHION - $C_8H_{10}NO_5PS$

Shipping Forms: Pure, wettable — Specific Gravity: 1.35

Solubility (mg/l): 50 — Vapor Pressure (mm Hg @ .06 °C):

Environmental Half Life: Hydrolyzes fairly rapidly in water[33]

Mammalian Toxicity (mg/Kg body wt): 9 rat (oral)[1]

Freshwater Critical Concentration: 7.5 ppm - 96 hr TL_m fathead minnow[1]

Saltwater Critical Concentration: 0.003 ppm - 96 hr TL_m grass shrimp[41]

MEVINPHOS - $C_7H_{13}O_6P$

Shipping Forms: Pure — Specific Gravity: 1.25

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @ _____ °C):

Environmental Half Life: Not persistent

Mammalian Toxicity (mg/Kg body wt): 4 rat (oral)[44]

Freshwater Critical Concentration: 0.023 ppm - 96 hr TL_m bluegill[44]

Saltwater Critical Concentration: .040 ppm - 24 hr LC_{50} hermit crab[41]

MOLYBDIC TRIOXIDE - MoO_3

Shipping Forms: Pure — Specific Gravity: 4.7

Solubility (mg/l): Sl. Sol. (5,000) — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: May precipitate

Mammalian Toxicity (mg/Kg body wt): 125 rat (oral)[1]

Freshwater Critical Concentration: 370 ppm - 96 hr TL_m fathead minnow[1]

Saltwater Critical Concentration: 370 ppm - approximated from freshwater data

MONOETHYLAMINE - $C_2H_5NH_2$

Shipping Forms: 70% solution — Specific Gravity: 0.689

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @ 16.6 °C): 760

Environmental Half Life: BOD_5 - .76 lb/lb (17% theoretical)[42]

Mammalian Toxicity (mg/Kg body wt): 400 rat (oral)[111]

Freshwater Critical Concentration: 40 ppm - 24 hr lethal concentration to chub[1]

Saltwater Critical Concentration: 40 ppm - approximated from freshwater data

MONOMETHYLAMINE - CH_5N

Shipping Forms: Anhydrous, 25%, 40-60% Specific Gravity: 0.699

Solubility (mg/l): 800,000 Vapor Pressure (mm Hg @ 7.5 °C): >760

Environmental Half Life: BOD_5 - estimated 20% theoretical from monoethylamine data

Mammalian Toxicity (mg/Kg body wt): 2500 rat (subcutaneous)[99]

Freshwater Critical Concentration: 30 ppm - 24 hr lethal to chub[1]

Saltwater Critical Concentration: 30 ppm - approximated from freshwater data

NALED - $C_4H_7Cl_2Br_2O_4P$

Shipping Forms: Pure Specific Gravity: 1.97

Solubility (mg/l): Sl. Sol. (500) Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydrolyses

Mammalian Toxicity (mg/Kg body wt): 430 rat (oral)[99]

Freshwater Critical Concentration: .18 ppm - 96 hr TL_m bluegill[91]

Saltwater Critical Concentration: .18 ppm - approximated from freshwater data

NAPHTHALENE - $C_{10}H_8$

Shipping Forms: Pure Specific Gravity: 1.162

Solubility (mg/l): 30 Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: 0 with sewage seed[81]

Mammalian Toxicity (mg/Kg body wt): 2000 rat (oral)[7]

Freshwater Critical Concentration: 4 ppm - 1 hr lethal to sunfish[1]

Saltwater Critical Concentration: 1.8 ppm - 72 hr critical level to fingerling salmon[1]

NAPHTHENIC ACID - $C_7H_{12}O_2$

Shipping Forms: Pure Specific Gravity: 1.050

Solubility (mg/l): 2010 Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Considered persistent

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 7.1 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 7.1 ppm - approximated from freshwater data

NICKEL ACETATE - $Ni(C_2H_3O_2).4H_2O$

Shipping Forms: Pure

Specific Gravity: 1.744

Solubility (mg/ℓ): 166,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxides and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt): 420 rat (low lethal dose I.V.)[8]

Freshwater Critical Concentration: 114 ppm - based on 27 ppm 96 hr LC_{50} to fathead minnow for nickel cation[6]

Saltwater Critical Concentration: 528 ppm - based on 125 ppm 48 hr LC_{50} to oyster for nickel cation[6]

NICKEL AMMONIUM SULFATE - $NiSO_4.(NH_4)_2SO_4.6H_2O$

Shipping Forms: Pure

Specific Gravity: 1.923

Solubility (mg/ℓ): 25,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 181 ppm - based on 27 ppm 96 hr LC_{50} to fathead minnow for nickel cation[6]

Saltwater Critical Concentration: 837 ppm - based on 125 ppm 48 hr LC_{50} to oyster for nickel cation[6]

NICKEL BROMIDE - $NiBr_2.3H_2O$

Shipping Forms: Pure

Specific Gravity: 4.64

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxides and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 125 ppm - based on 27 ppm 96 hr LC_{50} to fathead minnow for nickel cation[6]

Saltwater Critical Concentration: 578 ppm - based on 125 ppm 48 hr LC_{50} to oyster for nickel cation[6]

NICKEL CHLORIDE - $NiCl_2.6H_2O$

Shipping Forms: Pure

Specific Gravity: 3.55

Solubility (mg/ℓ): 2,540,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt): 1.5-30 dog (oral)[7]

Freshwater Critical Concentration: 109 ppm - based on 27 ppm 96 hr LC_{50} to fathead minnow for nickel cation[6]

Saltwater Critical Concentration: 504 ppm - based on 125 ppm 48 hr LC_{50} to oyster for nickel cation[6]

NICKEL FORMATE - $Ni(CHO_2)_2.2H_2O$

Shipping Forms: Pure

Specific Gravity: 2.154

Solubility (mg/ℓ): sol. (100,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 85 ppm - based on 27 ppm 96 hr LC_{50} to fathead minnow for nickel cation[6]

Saltwater Critical Concentration: 392 ppm - based on 125 ppm 48 hr LC_{50} to oyster for nickel cation[8]

NICKEL HYDROXIDE - $Ni(OH)_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): 13

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 43 ppm - based on 27 ppm 96 hr TL_m to fathead minnow for nickel cation[6]

Saltwater Critical Concentration: 197 ppm - based on 215 ppm 48 hr LC_{50} to oyster for nickel cation[8]

NICKEL NITRATE - $Ni(NO_3).6H_2O$

Shipping Forms: Pure

Specific Gravity: 2.05

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt): 1620 rat (oral)[11]

Freshwater Critical Concentration: 135 ppm - based on 27 ppm 96 hr LC_{50} to fathead minnow for nickel cation[6]

Saltwater Critical Concentration: 617 ppm - based on 125 ppm 48 hr LC_{50} to oyster for nickel cation[8]

NICKEL SULFATE - $NiSO_4.6H_2O$

Shipping Forms: Pure

Specific Gravity: 2.07

Solubility (mg/ℓ): >625,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt): 5 dog (subcutaneous)[11]

Freshwater Critical Concentration: 120 ppm - based on 27 ppm 96 hr TL_m to fathead minnow for nickel ion[6]

Saltwater Critical Concentration: 557 ppm - based on 125 ppm 48 hr LC_{50} to oyster for nickel cation[8]

NITRIC ACID - HNO_3

Shipping Forms: 58.5-68% HNO_3, 94.5-95.5% HNO_3, 36°, 38°, 40° and 42° Be
Specific Gravity: 1.502
Solubility (mg/ℓ): >1,000,000
Vapor Pressure (mm Hg @_____°C): 10
Environmental Half Life: Neutralizes with dilution

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 80 ppm - 96 hr TL_m bluegill in 10^{-3} alkalinity[1]

Saltwater Critical Concentration: 215 ppm - 48 hr LC_{50} Pogge[9]

NITROBENZENE - $C_6H_5NO_2$

Shipping Forms: Pure
Specific Gravity: 1.205
Solubility (mg/ℓ): 1900
Vapor Pressure (mm Hg @_____°C): Negligible
Environmental Half Life: BOD_5 - 0 with sewage seed[11]

Mammalian Toxicity (mg/Kg body wt): 700-799 mammal (oral)[7]

Freshwater Critical Concentration: 150 ppm - estimated 72 hr TL_m fathead minnow[9]

Saltwater Critical Concentration: 150 ppm - approximated from freshwater data

NITROGEN DIOXIDE - NO_2

Shipping Forms: Pure
Specific Gravity: 1.448 as liquid
Solubility (mg/ℓ): Forms nitric acid
Vapor Pressure (mm Hg @_____°C):
Environmental Half Life: Forms HNO_3 which neutralizes with dilution

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 58 ppm - based on hydrolysis product HNO_3[1]

Saltwater Critical Concentration: 157 ppm - based on hydrolysis product HNO_3[1]

NITROPHENOL - $C_6H_5NO_3$

Shipping Forms: Pure
Specific Gravity: 1.485
Solubility (mg/ℓ): 13,500
Vapor Pressure (mm Hg @_____°C): Negligible
Environmental Half Life: Persists without acclimation

Mammalian Toxicity (mg/Kg body wt): 328 lab animals (oral)[7]

Freshwater Critical Concentration: 46.3 ppm - 48 hr TL_m bluegill[7]

Saltwater Critical Concentration: 46.3 ppm - approximated from freshwater data

PARAFORMALDEHYDE - $(CH_2O)_n$

Shipping Forms: 91% flake, 95% powder, 98%
Specific Gravity: 1.46
Solubility (mg/l): 170,000
Vapor Pressure (mm Hg @ 24.1 °C):
Environmental Half Life: BOD_5 - 0.47 lb/lb - (44% theoretical)[42]

Mammalian Toxicity (mg/Kg body wt): 800 rat (oral)[10]

Freshwater Critical Concentration: 25 ppm - based on 25 ppm 96 hr TL_m to channel catfish for formaldehyde[7]

Saltwater Critical Concentration: 215 ppm - based on 215 ppm estimated 48 hr LC_{50} to flounder for formaldehyde[8]

PARATHION - $C_{10}H_{14}NO_5PS$

Shipping Forms: Pure, wettable
Specific Gravity: 1.26
Solubility (mg/l): 20
Vapor Pressure (mm Hg @ 0.6 °C):
Environmental Half Life: >1 year in water[34]

Mammalian Toxicity (mg/Kg body wt): 6.5 rat (oral)[114]

Freshwater Critical Concentration: 0.071 ppm - 96 hr TL_m bluegill[44]

Saltwater Critical Concentration: .007 ppm - estimated 48 hr LC_{50} shrimp[33]

PENTACHLOROPHENOL - C_6HCl_5O

Shipping Forms: Pure
Specific Gravity: 1.978
Solubility (mg/l): 80
Vapor Pressure (mm Hg @ _____ °C): Negligible
Environmental Half Life: Persistent

Mammalian Toxicity (mg/Kg body wt): 180 rat (oral)[109]

Freshwater Critical Concentration: 5 ppm - 3 hr lethal concentration bluegill[2]

Saltwater Critical Concentration: .25 ppm - based on <.25 ppm 48 hr LC_{50} oyster[69]

PHENOL - C_6H_6O

Shipping Forms: Pure, 90-92% (Cresol 7-8%) 95% (Cresol 8-10%) and 82-84% (Cresol 16-18%)
Specific Gravity: 1.071
Solubility (mg/l): 67,000
Vapor Pressure (mm Hg @ _____ °C): Negligible
Environmental Half Life: BOD_5 - 70% theoretical in freshwater, 55% in saltwater.[4]

Mammalian Toxicity (mg/Kg body wt): 530 rat (oral)[109]

Freshwater Critical Concentration: 12 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 23.5 ppm - 48 hr LC_{50} shrimp[33]

PHOSGENE - $COCl_2$

Shipping Forms: Pure

Specific Gravity: 1.392

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @ 7.5 °C): 700

Environmental Half Life: Decomposes to HCL which neutralizes with dilution

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 62 ppm - based on 46 ppm - 96 hr TL_m to bluegill for decomposition product HCL[1]

Saltwater Critical Concentration: 292 ppm - based on 215 ppm - 48 hr LC_{50} to shrimp for decomposition product HCL[6]

PHOSPHORIC ACID - H_3PO_4

Shipping Forms: 52-54%, 72%, 75%, 80%, 85% solutions

Specific Gravity: 1.834

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Neutralizes with dilution. Calcium precipitates phosphate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 200 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 934 ppm - 96 hr TL_{50} brook trout[7]

PHOSPHORUS - P_4

Shipping Forms: Pure

Specific Gravity: 1.83

Solubility (mg/l): 3

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydrolyses to H_3PO_4 after short term exposure to air and water

Mammalian Toxicity (mg/Kg body wt): 7 rabbit (oral)[10]

Freshwater Critical Concentration: .053 ppm - 72 hr TL_m bluegill[7]

Saltwater Critical Concentration: .003 ppm - 96 hr TL_{50} brook trout[7]

PHOSPHORUS OXYCHLORIDE - $POCl_3$

Shipping Forms: Pure

Specific Gravity: 1.67

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @ 7.5 °C): 14

Environmental Half Life: In water decomposes rapidly to HCL and H_3PO_4 which neutralizes with dilution

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 63 ppm - based on 46 ppm 96 hr TL_m to bluegill for hydrolysis product HCL[1]

Saltwater Critical Concentration: 296 ppm - based on 215 ppm 48 hr LC_{50} to shrimp for hydrolysis product HCL[6]

PHOSPHORUS PENTAFLUORIDE - PF_5

Shipping Forms: Pure

Specific Gravity: 4.49

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Decomposes to H_3PO_4 and HF

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 4.0 ppm - based on 3.1 ppm 96 hr TL_m to bluegill for hydrolysis product HF[1]

Saltwater Critical Concentration: 158 ppm - based on 120 ppm 48 hr TL_m to shrimp for hydrolysis product HF[1]

PHOSPHORUS PENTASULFIDE - P_2S_5

Shipping Forms: Pure

Specific Gravity: 2.03

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: In water decomposes rapidly to H_2SO_4 and H_3PO_4 which neutralize with dilution

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 55 ppm - based on 123 ppm 96 hr TL_m to bluegill for H_2SO_4 hydrolysis product[1]

Saltwater Critical Concentration: 33 ppm - based on 75 ppm 48 hr LC_{50} to crabs, shrimp for H_2SO_4 hydrolysis product[1]

PHOSPHORUS TRICHLORIDE - PCl_3

Shipping Forms: Pure

Specific Gravity: 1.574

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @ 7.5 °C): 52

Environmental Half Life: In water decomposes rapidly to HCL and H_3PO_4 which are neutralized with dilution

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 58 ppm - based on 46 ppm 96 hr TL_m to bluegill for HCL hydrolysis product[1]

Saltwater Critical Concentration: 273 ppm - based on 215 ppm 48 hr LC_{50} to shrimp for HCL hydrolysis product[1]

POLYCHLORINATED BIPHENYLS - $(C_6H_{5-x/2})_2Clx$

Shipping Forms: Pure

Specific Gravity: 1.182 - 1.492

Solubility (mg/ℓ): .3 - 5

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Bioconcentrative by a factor of 47,000[44]

Mammalian Toxicity (mg/Kg body wt): 500 - 4,000 rat (oral)[47]

Freshwater Critical Concentration: 0.278 ppm - 96 hr TL_m bluegill[44]

Saltwater Critical Concentration: 5 ppm - 48 hr LC_{50} penaied shrimp[8]

POTASSIUM ARSENATE - K_3AsO_4

Shipping Forms: Pure

Specific Gravity: 2.867

Solubility (mg/ℓ): 188,700

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Arsenate will precipitate with calcium and enter a soluble organic - insoluble inorganic cycle.

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 13 ppm - based on 30 ppm 168 hr TL_m goldfish for sodium arsenate[84]

Saltwater Critical Concentration: 13 ppm - approximated from freshwater data

POTASSIUM ARSENITE - $KAsO_2$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): sol. (50,000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Arsenite oxidises to arsenate. Arsenate can be concentrated 300 times.[83]

Mammalian Toxicity (mg/Kg body wt): 1140 rat (oral)[83]

Freshwater Critical Concentration: 34 ppm - based on 35 ppm 96 hr LC_{50} to bluegill for sodium arsenite[111]

Saltwater Critical Concentration: 34 ppm - approximated from freshwater data

POTASSIUM BICHROMATE - $K_2Cr_2O_7$

Shipping Forms: Pure

Specific Gravity: 2.68

Solubility (mg/ℓ): 49,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Chromium may be concentrated by a factor of 2,000[83] Chromates remain dissolved until reduced to the trivalent form

Mammalian Toxicity (mg/Kg body wt): 187 rat (oral)[111]

Freshwater Critical Concentration: 133 ppm - 96 hr TL_m bluegill[72]

Saltwater Critical Concentration: 147 ppm - based on 100 ppm 48 hr LC_{50} to prawn shrimp for CrO_3[8]

POTASSIUM CHROMATE - K_2CrO_4

Shipping Forms: Pure

Specific Gravity: 2.73

Solubility (mg/ℓ): 629,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Chromate will remain dissolved until reduced to trivalent form. Chromium may be concentrated by factor of 2000[83]

Mammalian Toxicity (mg/Kg body wt): 430 Human (low lethal dose oral)[83]

Freshwater Critical Concentration: 169 ppm - 96 hr TL_m bluegill[111]

Saltwater Critical Concentration: 194 ppm - based on 100 ppm 48 hr LC_{50} to brown shrimp for CrO_3[8]

POTASSIUM CYANIDE - KCN

Shipping Forms: Pure

Specific Gravity: 1.52

Solubility (mg/l): 500,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cyanide is oxidized in aerated water to less toxic cyanate

Mammalian Toxicity (mg/Kg body wt): 10 rat (oral)[119]

Freshwater Critical Concentration: 0.43 ppm - 96 TL_m bluegill[71]

Saltwater Critical Concentration: 0.25 ppm - 48 hr LC_{50} prawn[4]

POTASSIUM HYDROXIDE - KOH

Shipping Forms: Pure

Specific Gravity: 2.044

Solubility (mg/l): 970,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Neutralizes with dilution

Mammalian Toxicity (mg/Kg body wt): 1230 rat (oral)[118]

Freshwater Critical Concentration: 80 ppm - 96 hr TL_m mosquito fish[1]

Saltwater Critical Concentration: 53 ppm - based on ratio of saltwater to freshwater toxicity for sodium hydroxide

POTASSIUM PERMANGANATE - $KMnO_4$

Shipping Forms: Pure

Specific Gravity: 2.7

Solubility (mg/l): 63,800

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Permangnate ion is reduced slowly to less toxic forms

Mammalian Toxicity (mg/Kg body wt): 1090 rat (oral)[188]

Freshwater Critical Concentration: 4.2 ppm - 96 hr TL_m bluegill[71]

Saltwater Critical Concentration: 2.3 ppm - estimated 96 hr TL_m pompano[71]

PROPIONIC ACID - CH_3CH_2COOH

Shipping Forms: Pure

Specific Gravity: 0.993

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @ 7.5 °C): 1.4

Environmental Half Life: BOD_5 - .60 lb/lb (40% theoretical) with sewage seed[11]

Mammalian Toxicity (mg/Kg body wt): 4290 rat (oral)[181]

Freshwater Critical Concentration: 188 ppm - 24 hr TL_m bluegill[11]

Saltwater Critical Concentration: 188 ppm - approximated from freshwater data

PROPIONIC ANHYDRIDE - $(CH_3CH_2CO)_2O$

Shipping Forms: Pure

Specific Gravity: 1.013

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Decomposes to propionic acid. BOD_5 - 40% theoretical with sewage seed[1]

Mammalian Toxicity (mg/Kg body wt): 2360 rat (oral)[1,2,3]

Freshwater Critical Concentration: 165 ppm - based on 188 ppm 24 hr TL_m to bluegill for propionic acid hydrolysis product[17]

Saltwater Critical Concentration: 165 ppm - approximated from freshwater data.

PROPYL ALCOHOL - $CH_3(CH_2)_2OH$

Shipping Forms: Pure

Specific Gravity: 0.804

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @ 7.5 °C): 5.6

Environmental Half Life: BOD_5 - 64% in fresh water, 53% in salt water[4]

Mammalian Toxicity (mg/Kg body wt): 1870 rat (oral)[1,2,3]

Freshwater Critical Concentration: 350 ppm - estimated 24 hr TL_m creek chub[17]

Saltwater Critical Concentration: 4200 ppm - 24 hr TL_m brine shrimp[4]

PYRETHRINS - $C_{21}H_{28}O_3$

Shipping Forms: Pure, wettable

Specific Gravity: >1.0

Solubility (mg/ℓ): insol. (1)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: moderately persistent

Mammalian Toxicity (mg/Kg body wt): 1200 rat (oral)[9,8]

Freshwater Critical Concentration: 74 ppm - 96 hr TL_m bluegill[9,8]

Saltwater Critical Concentration: 74 ppm - approximated from freshwater data.

PYROGALLIC ACID - $C_6H_6O_3$

Shipping Forms: Pure

Specific Gravity: 1.45

Solubility (mg/ℓ): 600,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - .016 lb/lb (1% theoretical) with sewage seed[11]

Mammalian Toxicity (mg/Kg body wt): 25 dog (oral)[1]

Freshwater Critical Concentration: 18 ppm - 48 hr TL_m goldfish[1]

Saltwater Critical Concentration: 18 ppm - approximated from freshwater data.

QUINOLINE - C_9H_7N

Shipping Forms: Pure

Specific Gravity: 1.09

Solubility (mg/ℓ): 60,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 1.75 lb/lb (50% theoretical) using sewage seed.[21] Also subject to photodegradation.

Mammalian Toxicity (mg/Kg body wt): 460 rat (oral)[133]

Freshwater Critical Concentration: 5 ppm - 14 hr lethal to rainbow trout[1]

Saltwater Critical Concentration: 5 ppm - approximated from freshwater data.

RESORCINOL - $C_6H_6O_2$

Shipping Forms: Pure

Specific Gravity: 1.27

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 1.15 lbs/lb (61% theoretical) with sewage seed[21]

Mammalian Toxicity (mg/Kg body wt): 980 rat (oral)[133]

Freshwater Critical Concentration: 35 ppm - toxic threshold for bleak and carp[1]

Saltwater Critical Concentration: 35 ppm - approximated from freshwater data.

SELENIC ACID - $H_2SeO_4 \cdot 4H_2O$

Shipping Forms: Pure

Specific Gravity: 2.608

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persists, but may precipitate. May be concentrated up to 400 times.[33]

Mammalian Toxicity (mg/Kg body wt): 3 rat (I.V.)[98]

Freshwater Critical Concentration: 26 ppm based on 12 ppm 168 hr TL_m for selenium dioxide[34]

Saltwater Critical Concentration: 26 ppm - approximated from freshwater data.

SELENIUM OXIDE - SeO_2

Shipping Forms: Pure

Specific Gravity: 3.95

Solubility (mg/ℓ): 384,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Forms selenic acid. May be concentrated up to 400 times.[33]

Mammalian Toxicity (mg/Kg body wt): 4 rabbit (subcutaneous)[98]

Freshwater Critical Concentration: 12 ppm 168 Hr TL_m goldfish.[34]

Saltwater Critical Concentration: 12 ppm - approximated from freshwater data.

SEVIN - $C_{10}H_7OCONHCH_3$

Shipping Forms: Pure, wettable — Specific Gravity: 1.232

Solubility (mg/l): 1000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persists less than 2 weeks in river water[88]

Mammalian Toxicity (mg/Kg body wt): 505 rat (oral)[114]

Freshwater Critical Concentration: 6.7 ppm - 96 hr TL_m bluegill[88]

Saltwater Critical Concentration: 3 ppm - 48 hr TL_{50} oyster[89]

SODIUM - Na

Shipping Forms: Pure — Specific Gravity: 0.9715

Solubility (mg/l): Decomposes — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Decomposes to NaOH which is neutralized with dilution

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 57 ppm - based on 99 ppm 48 Hr TL_m to bluegill for hydrolysis product NaOH.[1]

Saltwater Critical Concentration: 39 ppm - based on 67 ppm estimated 48 Hr LC_{50} to shrimp for NaOH hydrolysis product.[6]

SODIUM ARSENATE - $Na_3AsO_4.12H_2O$

Shipping Forms: Pure — Specific Gravity: 1.76

Solubility (mg/l): 389,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Calcium arsenate will precipitate, but biological action can resolubilize leading to cycling.[78]

Mammalian Toxicity (mg/Kg body wt): 238 rat (oral)[107]

Freshwater Critical Concentration: 28 ppm - 168 Hr TL_m goldfish [34]

Saltwater Critical Concentration: 28 ppm - approximated from freshwater data

SODIUM ARSENITE - $NaAsO_2$

Shipping Forms: Pure — Specific Gravity: 1.87

Solubility (mg/l): v. sol. (100,000) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Will oxidize to arsenate and enter a cycling process transferring from soluble to insoluble forms and back.[78]

Mammalian Toxicity (mg/Kg body wt): 41 rat (oral)[88]

Freshwater Critical Concentration: 35 ppm - 96 hr LC_{50} bluegill[111]

Saltwater Critical Concentration: 35 ppm - approximated from freshwater data

SODIUM BICHROMATE - $Na_2Cr_2O_7.2H_2O$

Shipping Forms: Pure

Specific Gravity: 2.348

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Bichromate may exist in solution indefinitely.

Mammalian Toxicity (mg/Kg body wt): 140 rat (im)[22]

Freshwater Critical Concentration: 213 ppm - 48 Hr TL_m bluegill [1]

Saltwater Critical Concentration: 149 ppm - based on 100 ppm 48 Hr LC_{50} to brown shrimp for CrO_3.[9]

SODIUM BIFLUORIDE - NaF.HF

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): 32,500

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Fluoride is precipitated by calcium ions

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 5 ppm - based on 6.7 ppm 48 Hr LC_{50} to rainbow trout for NaF.[22]

Saltwater Critical Concentration: 221 ppm - based on >300 ppm 48 Hr LC_{50} to prawn for NaF.[23]

SODIUM BISULFITE - $NaHSO_3$

Shipping Forms: Anhydrous, 38% solution

Specific Gravity: 1.48

Solubility (mg/l): 300,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Oxidizes to Sulfate

Mammalian Toxicity (mg/Kg body wt): 115 Rate (I.V.)[100]

Freshwater Critical Concentration: 240 ppm - 96 Hr TL_m mosquito fish (turbid water) [1]

Saltwater Critical Concentration: 240 ppm - approximated from freshwater data

SODIUM CHROMATE

Shipping Forms: Pure

Specific Gravity: 1.483

Solubility (mg/l): 317,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Chromium can persist in solution until reduced to the trivalent form. Chromium may be concentrated by a factor of 2000.[23]

Mammalian Toxicity (mg/Kg body wt): 243 rabbit (subcutaneous)[100]

Freshwater Critical Concentration: 300 ppm - 24 Hr TL_m bluegill[1]

Saltwater Critical Concentration: 342 ppm - based on 100 ppm 48 Hr LC_{50} to brown shrimp for CrO_3.[23]

SODIUM CYANIDE

Shipping Forms: Pure, solution

Specific Gravity: >1.0

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Cyanide oxidizes to less toxic cyanate in aerated water.

Mammalian Toxicity (mg/Kg body wt): 5.22 sheep (lethal dose oral)[1]

Freshwater Critical Concentration: 0.15 ppm - 96 Hr TL_m bluegill.[7]

Saltwater Critical Concentration: 0.19 ppm - based on .25 ppm 48 hr LC_{50} prawn for KCN[8]

SODIUM DODECYLBENZENESULFONATE - $O_3SC_{18}H_{30}.Na$

Shipping Forms: Solid

Specific Gravity: >1.0

Solubility (mg/ℓ): Sol. (50,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - 43% Theoretical with activated sludge.[11]

Mammalian Toxicity (mg/Kg body wt): 1400 rat (oral)[1]

Freshwater Critical Concentration: 19 ppm - 96 Hr TL_m - bluegill.[7]

Saltwater Critical Concentration: 10.1 ppm - 96 Hr TL_m - mullet.[7]

SODIUM FLUORIDE - NaF

Shipping Forms: Pure

Specific Gravity: 2.78

Solubility (mg/ℓ): 43,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Calcium salt precipitates

Mammalian Toxicity (mg/Kg body wt): 75 human (low lethal dose oral)[10]

Freshwater Critical Concentration: 6.7 ppm - 48 Hr LC_{50} rainbow trout.[11]

Saltwater Critical Concentration: 300 ppm - based on >300 ppm 48 Hr LC_{50} prawn.[11]

SODIUM HYDROSULFIDE - NaHS

Shipping Forms: Pure

Specific Gravity: 1.79

Solubility (mg/ℓ): v. sol. (100,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydrolyses to NaOH and Na_2S in time

Mammalian Toxicity (mg/Kg body wt): 115 rat (I.V.)[10]

Freshwater Critical Concentration: 10 ppm - 24 Hr lethal creek chub.[1]

Saltwater Critical Concentration: 10 ppm - approximated from freshwater data

SODIUM HYDROXIDE - NaOH

Shipping Forms: Pure

Specific Gravity: 2.13

Solubility (mg/l): 420,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Neutralizes with dilution

Mammalian Toxicity (mg/Kg body wt): 500 rabbit (oral)[10]

Freshwater Critical Concentration: 99 ppm - 48 Hr TL_m bluegill.[1]

Saltwater Critical Concentration: 67 ppm - estimated 48 Hr LC_{50} shrimp.[4]

SODIUM HYPOCHLORITE - NaOCl

Shipping Forms: Solution Only

Specific Gravity: >1.0

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Subject to equilibrium partition between NaOH, HOCl, OCl^- and Cl_2

Mammalian Toxicity (mg/Kg body wt): 12 rat (low lethal dose oral)[12]

Freshwater Critical Concentration: .21 ppm - based on 0.1 ppm 96 Hr TL_{50} to fathead minnow for chlorine which is released.[11]

Saltwater Critical Concentration: 2.1 ppm - based on effects of chlorine to oysters, cessation of pumping.[1]

SODIUM METHYLATE - $NaOCH_3$

Shipping Forms: Pure

Specific Gravity: ~0.56

Solubility (mg/l): Decomposes

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Decomposes to NaOH which neutralizes with dilution and methanol which biodegrades

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 134 ppm - based on 99 ppm 48 Hr TL_m to bluegill for hydrolysis product NaOH.[1]

Saltwater Critical Concentration: 90 ppm - based on 67 ppm estimated 48 hr LC_{50} to shrimp for hydrolysis product NaOH.[1]

SODIUM NITRITE - $NaNO_2$

Shipping Forms: Pure

Specific Gravity: 2.17

Solubility (mg/l): 815,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Forms nitrous acid which will oxidize to nitric acid and subsequently will be neutralized with dilution.

Mammalian Toxicity (mg/Kg body wt): rat 180 (oral)[10]

Freshwater Critical Concentration: 7.5 ppm - 96 Hr TL_m mosquito fish (turbid water).[1]

Saltwater Critical Concentration: 7.5 ppm - approximated from freshwater data

SODIUM PHOSPHATE (monobasic) - $NaH_2PO_4.H_2O$

Shipping Forms: Pure — Specific Gravity: 2.04

Solubility (mg/l): 599,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Phosphate will be precipitated

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 720 ppm - 96 hr TL_m mosquito fish (turbid water).[1]

Saltwater Critical Concentration: 720 ppm - approximated from freshwater data

SODIUM PHOSPHATE (dibasic) - $Na_2HPO_4.7H_2O$

Shipping Forms: Pure — Specific Gravity: 1.67

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Phosphate will precipitate.

Mammalian Toxicity (mg/Kg body wt): 2000 rat (IP)[99]

Freshwater Critical Concentration: 426 ppm - 96 Hr TL_m daphnia magna.[27]

Saltwater Critical Concentration: 426 ppm - approximated from freshwater data

SODIUM PHOSPHATE (tribasic) - $Na_3PO_4.12H_2O$

Shipping Forms: Pure — Specific Gravity: 1.645

Solubility (mg/l): 15,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Phosphate will precipitate.

Mammalian Toxicity (mg/Kg body wt): 430 rat (IP)[99]

Freshwater Critical Concentration: 151 ppm - 96 Hr TL_m mosquito fish.[1]

Saltwater Critical Concentration: 151 ppm - approximated from freshwater data

SODIUM SELENITE - $Na_2SeO_3.5H_2O$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/l): sol. (100,000) — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persists at low levels. May oxidize to selenate. Selenium can can be concentrated 400 times[23]

Mammalian Toxicity (mg/Kg body wt): 7 rat (oral,[99]

Freshwater Critical Concentration: 55 ppm - estimated 96 hour LC_{50} for fathead minnow[134]

Saltwater Critical Concentration: 55 ppm - approximated from freshwater data

SODIUM SULFIDE - $Na_2S.9H_2O$

Shipping Forms: Pure

Specific Gravity: 2.47

Solubility (mg/ℓ): 475,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Sulfide will oxidize to sulfate

Mammalian Toxicity (mg/Kg body wt): 53 mouse (I.P.)[9]

Freshwater Critical Concentration: 61 ppm - 48 hr TL_m Bluegill[1]

Saltwater Critical Concentration: 61 ppm - approximated from freshwater data

STRONTIUM CHROMATE - $SrCrO_4$

Shipping Forms: Pure

Specific Gravity: 3.895

Solubility (mg/ℓ): 1200

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Chromium persists in dissolved state until reduced to trivalent form. Chromium may be concentrated by a factor of 2000[19]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 179 ppm - based on 300 ppm 24 hr TL_m to bluegill for sodium chromate[1]

Saltwater Critical Concentration: 204 ppm - based on 342 ppm critical concentration for sodium chromate

STRYCHNINE - $C_{21}H_{22}N_2O_2$

Shipping Forms: Pure

Specific Gravity: 1.36

Solubility (mg/ℓ): 160

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Moderately persistent

Mammalian Toxicity (mg/Kg body wt): 30 Human (low lethal dose oral)

Freshwater Critical Concentration: 28 ppm - based on 56.7 mg fatal dose to man and 2 liter water consumption[1]

Saltwater Critical Concentration: 1.7 ppm - based on 1.7 ppm strychnine nitrate required to incapacitate lemon shark in 10 minutes[21]

STYRENE - $C_6H_5CHCH_2$

Shipping Forms: Pure

Specific Gravity: 0.909

Solubility (mg/ℓ): 320

Vapor Pressure (mm Hg @_____°C): 10

Environmental Half Life: BOD_5 - 65% theoretical in freshwater, 8% in saltwater[5]

Mammalian Toxicity (mg/Kg body wt): 4920 rat (oral)[11]

Freshwater Critical Concentration: 22 ppm - 96 hr TL_m bluegill[14]

Saltwater Critical Concentration: 52 ppm - 48 TL_m brine shrimp[5]

SULFURIC ACID - H_2SO_4

Shipping Forms: 100%, 66° Be, 60° Be and 20% fuming oleum — Specific Gravity: 1.834

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @ 20 °C): 0.6

Environmental Half Life: Neutralizes with dilution

Mammalian Toxicity (mg/Kg body wt): 2140 rat (oral)[12]

Freshwater Critical Concentration: 123 ppm - 96 hr TL_m bluegill based on acidity at 10^{-3} alkalinity[1]

Saltwater Critical Concentration: 215 ppm - 48 hr LC_{50} flounder[11]

SULFUR MONOCHLORIDE - S_2Cl_2

Shipping Forms: Pure — Specific Gravity: 1.69

Solubility (mg/l): Decomposes — Vapor Pressure (mm Hg @ 7.5 °C): 2.2

Environmental Half Life: Decomposes to HCl, H_2SO_4, sodium sulfite, and thiosulfite

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 86 ppm - based on 46 ppm 96 hr TL_m to bluegill for HCl hydrolysis product[1]

Saltwater Critical Concentration: 403 ppm - based on 215 ppm estimated 48 hr LC_{50} to shrimp for HCl hydrolysis product[1]

2,4,5-T (acid) - $Cl_3C_6H_2OCH_2COOH$

Shipping Forms: Pure, wettable — Specific Gravity: 1.21

Solubility (mg/l): 140 — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Loss is 44% in 4 days. This increases to 79% with low intensity sunlight and 92% with high intensity[11]

Mammalian Toxicity (mg/Kg body wt): 300 rat (oral)[1]

Freshwater Critical Concentration: 11 ppm - 24 hr TL_m bluegill[11]

Saltwater Critical Concentration: .14 ppm - 96 hr EC_{50} oyster[14]

2,4,5-T (esters) - $Cl_3C_6H_2OCH_2COO$+ester

Shipping Forms: Pure, wettable — Specific Gravity: 1.21

Solubility (mg/l): 140 — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: More persistent than acid

Mammalian Toxicity (mg/Kg body wt): 300 rat (oral)[1]

Freshwater Critical Concentration: 17 ppm - varies greatly - this is 48 hr TL_m to bluegill for propylene glycol butyl ether ester[11]

Saltwater Critical Concentration: 17 ppm - approximated from freshwater data

TANNIC ACID - $C_{76}H_{52}O_{46}$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: BOD_5 - .38 lb/lb (~ 58 theoretical) with sewage seed[11]

Mammalian Toxicity (mg/Kg body wt): 6000 rat (LD_{100})[111]

Freshwater Critical Concentration: 37 ppm - 96 hr TL_m mosquito fish[7]

Saltwater Critical Concentration: 37 ppm - approximated from freshwater data

TDE - $C_{14}H_{10}Cl_4$

Shipping Forms: Pure, wettable

Specific Gravity: 1.29

Solubility (mg/l): insol. (100)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Persistent

Mammalian Toxicity (mg/Kg body wt): 3400 rat (oral)[54]

Freshwater Critical Concentration: .042 ppm - 96 hr TL_m bluegill[91]

Saltwater Critical Concentration: .042 ppm - approximated from freshwater data

TETRAETHYL LEAD - $(C_2H_5)_4Pb$

Shipping Forms: Pure

Specific Gravity: 1.659

Solubility (mg/l): 30

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Persistent and bioconcentrative

Mammalian Toxicity (mg/Kg body wt): 10 rat (I.P.)[1]

Freshwater Critical Concentration: 0.2 ppm - 96 hr TL_m bluegill[7]

Saltwater Critical Concentration: 0.2 ppm - approximated from freshwater data

TETRAETHYL PYROPHOSPHATE - $(C_2H_5)_4P_2O_7$

Shipping Forms: Pure

Specific Gravity: 1.185

Solubility (mg/l): >1,000,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: 7 hrs.

Mammalian Toxicity (mg/Kg body wt): 1.2 rat (oral)[54]

Freshwater Critical Concentration: 0.84 ppm - 96 hr TL_m bluegill[54]

Saltwater Critical Concentration: 0.84 ppm - approximated from freshwater data

TOLUENE - $C_6H_5CH_3$

Shipping Forms: Pure

Specific Gravity: 0.866

Solubility (mg/ℓ): 470

Vapor Pressure (mm Hg @ 7.5 °C): 11

Environmental Half Life: Biodegrades with acclimation

Mammalian Toxicity (mg/Kg body wt): 5850 rat (oral)[111]

Freshwater Critical Concentration: 24 ppm - 96 hr TL_m bluegill[11]

Saltwater Critical Concentration: 33 ppm - 24 hr TL_m brine shrimp[1]

TOXAPHENE - $C_{10}H_{10}Cl_8$

Shipping Forms: Pure, wettable

Specific Gravity: 1.66

Solubility (mg/ℓ): 1.5

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Persistent. Bioconcentrates in oysters to 2920[11]

Mammalian Toxicity (mg/Kg body wt): 69 rat (oral)[1]

Freshwater Critical Concentration: .0035 ppm 96 hr TL_m bluegill[11]

Saltwater Critical Concentration: .045 ppm - 48 hr TL_m brown shrimp[11]

TRICHLORFON - $C_4H_8Cl_3O_4P$

Shipping Forms: Pure

Specific Gravity: 1.73

Solubility (mg/ℓ): 130,000

Vapor Pressure (mm Hg @ _____ °C):

Environmental Half Life: Persistent

Mammalian Toxicity (mg/Kg body wt): 450 rat (oral)[11]

Freshwater Critical Concentration: 180 ppm - 96 hr TL_m fathead minnow[11]

Saltwater Critical Concentration: 180 ppm - approximated from freshwater data

TRICHLOROPHENOL - $C_6H_3Cl_3O$

Shipping Forms: Pure

Specific Gravity: 1.49

Solubility (mg/ℓ): 800

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: BOD_{96} - 4.1% theoretical with pure bacteria culture[1]

Mammalian Toxicity (mg/Kg body wt): 820 rat (oral)[11]

Freshwater Critical Concentration: .1 ppm - 96 hr TL_m fathead minnow[111]

Saltwater Critical Concentration: .1 ppm - approximated from freshwater data

TRIETHANOLAMINE DODECYLBENZENESULFONATE - $(O_3SC_{18}H_{10})(CH_2OHCH_2)_3N$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/l): sol. (100,000) — Vapor Pressure (mm Hg @ _____ °C):

Environmental Half Life: BOD_5 - 43% theoretical based on sodium salt[11]

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 22 ppm - based on 19 ppm - 96 hr TL_m to bluegill for sodium salt[9]

Saltwater Critical Concentration: 13 ppm - based on 10.1 ppm - 96 hr TL_m to mullet for sodium salt[9]

TRIETHYLAMINE - $(C_2H_5)_3N$

Shipping Forms: Pure — Specific Gravity: 0.729

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @ 20 °C): 45

Environmental Half Life: Moderately degradable assume ~BOD_5 - 30% theoretical

Mammalian Toxicity (mg/Kg body wt): 460 rat (oral)[7]

Freshwater Critical Concentration: 80 ppm - 24 hr lethal to fish[1]

Saltwater Critical Concentration: 80 ppm - approximately from freshwater data

TRIMETHYLAMINE - $(CH_3)_3N$

Shipping Forms: Anhydrous, 40-60% solution — Specific Gravity: 0.662

Solubility (mg/l): 410,000 — Vapor Pressure (mm Hg @ 7.5 °C): >760

Environmental Half Life: Moderately degradable - assume BOD_5 - 30% theoretical

Mammalian Toxicity (mg/Kg body wt): 400 rabbit (oral)[111]

Freshwater Critical Concentration: 48 ppm - approximated from 80 ppm lethal level to fish for triethylamine[1]

Saltwater Critical Concentration: 108 ppm - approximated from freshwater data

URANIUM PEROXIDE - $UO_4.2H_2O$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/l): 6 — Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Precipitates

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: .25 ppm - based on 2.8 ppm 96 hr TL_m fathead minnow for uranyl sulfate[1]

Saltwater Critical Concentration: 108 ppm - approximated from freshwater data

URANYL ACETATE - $UO_2(C_2H_3O_2)_2 \cdot 2H_2O$

Shipping Forms: Pure — Specific Gravity: 2.893

Solubility (mg/l): 76,940 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Will precipitate as uranium salt

Mammalian Toxicity (mg/Kg body wt): 400 rat (I.P.)**

Freshwater Critical Concentration: 178 ppm - 96 hr TL_m fathead minnow[1] extrapolated to hardwater from uranyl sulfate data[1]

Saltwater Critical Concentration: 178 ppm - approximated from freshwater data

URANYL NITRATE - $UO_2(NO_3)_2 \cdot 6H_2O$

Shipping Forms: Pure — Specific Gravity: 2.807

Solubility (mg/l): >1,000,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Precipitated as uranium ion

Mammalian Toxicity (mg/Kg body wt): 135 rat (I.P.)**

Freshwater Critical Concentration: 149 ppm - 96 hr TL_m fathead minnow[1] extrapolated to hardwater from uranyl sulfate data[1]

Saltwater Critical Concentration: 149 ppm - approximated from freshwater data

URANYL SULFATE - $UO_2SO_4 \cdot 3H_2O$

Shipping Forms: Pure — Specific Gravity: 3.28

Solubility (mg/l): 205,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Precipitates as uranium salt

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 2.8 ppm - 96 hr TL_m fathead minnow[1]

Saltwater Critical Concentration: 2.8 ppm - approximated from freshwater data

135 135

VANADIUM OXYTRICHLORIDE - $VOCl_3$

Shipping Forms: Pure — Specific Gravity: 2.824

Solubility (mg/l): insol. (500) -decomposes — Vapor Pressure (mm Hg @ 12.2 °C): 10

Environmental Half Life: Many vanadium salts are insoluble. Slowly decomposes in water.

Mammalian Toxicity (mg/Kg body wt): 140 rat (oral)**

Freshwater Critical Concentration: 104 ppm - based on 55 ppm 96 hr TL_m to bluegill for vanadium pentoxide[1]

Saltwater Critical Concentration: 104 ppm - approximated from freshwater data

VANADIUM PENTOXIDE - V_2O_5

Shipping Forms: Pure

Specific Gravity: 3.357

Solubility (mg/ℓ): 8000

Vapor Pressure (mm Hg @ _____ °C):

Environmental Half Life: Many vanadium salts are insoluble

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 55 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 55 ppm - approximated from freshwater data

VANADYL SULFATE - $VOSO_4$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): sol. (5000)

Vapor Pressure (mm Hg @ _____ °C): Negligible

Environmental Half Life: Many vanadium salts are insoluble

Mammalian Toxicity (mg/Kg body wt): 1 rat (oral as V)[7]

Freshwater Critical Concentration: 55 ppm - 96 hr TL_m bluegill[8,1]

Saltwater Critical Concentration: 55 ppm - approximated from freshwater data

VINYL ACETATE - $CH_3COOCHCH_2$

Shipping Forms: Pure

Specific Gravity: 0.9317

Solubility (mg/ℓ): 20,000

Vapor Pressure (mm Hg @ 7.5 °C): 45

Environmental Half Life: BOD_5 - 35% theoretical in freshwater, 51% in saltwater[9]

Mammalian Toxicity (mg/Kg body wt): 2120 rat (oral)[7]

Freshwater Critical Concentration: 18 ppm - 96 hr TL_m bluegill[10]

Saltwater Critical Concentration: 50 ppm - estimated 48 hr LC_{50} shrimp[4]

XYLENE - $C_6H_4(CH_3)_2$

Shipping Forms: Pure

Specific Gravity: 0.8685

Solubility (mg/ℓ): insol. (500)

Vapor Pressure (mm Hg @ 7.5 °C): 2.5

Environmental Half Life: BOD_5 - 0[11]

Mammalian Toxicity (mg/Kg body wt) 4000 rat (oral)[11,1]

Freshwater Critical Concentration: 22 ppm - 96 hr TL_m bluegill[11,4]

Saltwater Critical Concentration: 30 ppm - based on ratio of saltwater to freshwater toxicity noted for toluene

XYLENOL - $(CH_3)_2C_6H_3OH$

Shipping Forms: Pure — Specific Gravity: 1.04

Solubility (mg/l): sl. sol. (5000) — Vapor Pressure (mm Hg @ 50 °C): 1

Environmental Half Life: BOD_5 - 31% theoretical[99]

Mammalian Toxicity (mg/Kg body wt): 296-727 rat (oral)[114]

Freshwater Critical Concentration: 36 ppm - estimated 24 hr TL_m tench, carp[1]

Saltwater Critical Concentration: 36 ppm - approximated from freshwater data

ZECTRAN - $C_{12}H_{18}N_2O_2$

Shipping Forms: Pure, wettable — Specific Gravity: >1.0

Solubility (mg/l): 100 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Moderately persistent

Mammalian Toxicity (mg/Kg body wt): 19 rat (oral)[99]

Freshwater Critical Concentration: 11.2 ppm - 96 hr TL_m bluegill[99]

Saltwater Critical Concentration: 11.2 ppm - approximated from freshwater data

ZINC ACETATE - $Zn(C_2H_3O_2)_2.2H_2O$

Shipping Forms: Pure — Specific Gravity: 1.74

Solubility (mg/l): 310,000 — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate.

Mammalian Toxicity (mg/Kg body wt): 2460 rat (oral)[1]

Freshwater Critical Concentration: 42 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 32 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[8]

ZINC AMMONIUM CHLORIDE - $ZnCl_2.NH_4Cl$

Shipping Forms: Pure — Specific Gravity: >1.0

Solubility (mg/l): Decomposes — Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 37 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 26 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[8]

ZINC BICHROMATE - $ZnCr_2O_7.3H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): sl. sol. (1000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide and carbonate salts precipitate. Zinc accumulates in organisms but is not considered bioconcentrative

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 64 ppm - based on 12.5 ppm 96 hr TL_m bluegill for zinc ion[1]

Saltwater Critical Concentration: 49 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[6]

ZINC BORATE - $3ZnO.2B_2O_3$

Shipping Forms: Pure

Specific Gravity: 3.64

Solubility (mg/ℓ): sol. (50,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 24 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 19 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[6]

ZINC BROMIDE

Shipping Forms: Pure

Specific Gravity: 4.219

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 43 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for $ZnCl_2$[1]

Saltwater Critical Concentration: 33 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[6]

ZINC CARBONATE

Shipping Forms: Pure

Specific Gravity: 4.42

Solubility (mg/ℓ): 10

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide and carbonate salts precipitate. Zinc accumulates in organisms but is not considered bioconcentrative

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 24 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 18 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[6]

ZINC CHLORIDE

Shipping Forms: Pure

Specific Gravity: 2.91

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt): 350 rat (oral)[7]

Freshwater Critical Concentration: 26 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 20 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[8]

ZINC CYANIDE

Shipping Forms: Pure

Specific Gravity: 1.852

Solubility (mg/ℓ): 5

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide and carbonate salts precipitate. Cyanide will oxidize to less toxic cyanate. Zinc accumulates in organisms but is not considered bioconcentrative

Mammalian Toxicity (mg/Kg body wt): 100 rat (low lethal dose I.P.)

Freshwater Critical Concentration: .18 ppm - based on .15 ppm 96 hr TL_m to bluegill NaCN[11]

Saltwater Critical Concentration: .23 ppm - based on .19 ppm 48 hr LC_{50} to prawn for NaCN[8]

ZINC FLUORIDE - $ZnF_2 \cdot 4H_2O$

Shipping Forms: Pure

Specific Gravity: 2.535

Solubility (mg/ℓ): 16,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide and carbonate salts precipitate. Zinc accumulates in organisms but is not considered bioconcentrative

Mammalian Toxicity (mg/Kg body wt): 200 guinea (low lethal dose oral)[10]

Freshwater Critical Concentration: 14 ppm - based on 6.7 ppm 48 hr LC_{50} to rainbow trout for NaF[12]

Saltwater Critical Concentration: 26 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[8]

ZINC FORMATE - $Zn(CHO_2)_2$

Shipping Forms: Pure

Specific Gravity: 2.36

Solubility (mg/ℓ): 52,000

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide and carbonate salts precipitate. Zinc accumulates in organisms but is not considered bioconcentrative

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 30 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 23 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[8]

ZINC HYDROSULFITE - ZnS_2O_4

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): sol. (50,000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide and carbonate salts precipitate. Zinc accumulates in organisms but is not considered bioconcentrative

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 38 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 29 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[9]

ZINC NITRATE - $Zn(NO_3)_2.6H_2O$

Shipping Forms: Pure

Specific Gravity: 2.07

Solubility (mg/ℓ): >1,000,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt): 2500 rat (oral)[10]

Freshwater Critical Concentration: 57 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 43 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[9]

ZINC PERMANGANATE - $Zn(MuO_4)_2.6H_2O$

Shipping Forms: Pure

Specific Gravity: 2.47

Solubility (mg/ℓ): v. sol. (330,000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide and carbonate salts precipitate. Zinc accumulates in organisms but is not considered bioconcentrative

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 79 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 60 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[9]

ZINC PHENOLSULFONATE - $Zn(C_6H_5SO_4)_2.8H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): 625,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 107 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 81 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[9]

ZINC PHOSPHIDE - Zn_3P_2

Shipping Forms: Pure

Specific Gravity: 4.55

Solubility (mg/ℓ): Insol. (500)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt): 41 rat (oral)[11]

Freshwater Critical Concentration: 17 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 13 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[1]

ZINC POTASSIUM CHROMATE - $ZnCrO_4 . K_2CrO_4$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): Insol. (500)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide and carbonate salts precipitate. Zinc and chrome accumulate in organisms but they are not considered bioconcentrative

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 72 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 55 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[1]

ZINC PROPIONATE

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): Sol. (50,000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 41 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 31 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[1]

ZINC SILICOFLUORIDE

Shipping Forms: Pure

Specific Gravity: 2.104

Solubility (mg/ℓ): v. sol. (10,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate

Mammalian Toxicity (mg/Kg body wt): 100 rat (low lethal dose oral)[11]

Freshwater Critical Concentration: 61 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 46 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[1]

ZINC SULFATE

Shipping Forms: Pure

Specific Gravity: 1.97

Solubility (mg/l): 965,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Zinc accumulates in organisms but is not considered bioconcentrative. Hydroxide and carbonate salts precipitate.

Mammalian Toxicity (mg/Kg body wt): 40 rat (I.P.)[11]

Freshwater Critical Concentration: 55 ppm - based on 12.5 ppm 96 hr TL_m to bluegill for zinc ion[1]

Saltwater Critical Concentration: 42 ppm - based on 9.5 ppm 48 hr LC_{50} to shrimp for zinc ion[9]

ZIRCONIUM ACETATE - $H_2ZrO_2(C_2H_3O_2)_2$

Shipping Forms: 13% ZrO_2, 22% ZrO_2

Specific Gravity: 1.2-1.46

Solubility (mg/l): sol. (50,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide will precipitate

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 307 ppm - based on 115 ppm 96 hr TL_m to fathead minnow for Zr[1]

Saltwater Critical Concentration: 307 ppm - approximated from freshwater data

ZIRCONIUM NITRATE - $Zr(NO_3)_4.5H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): sol. (50,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide salt precipitates

Mammalian Toxicity (mg/Kg body wt): 853 rat (oral)[1]

Freshwater Critical Concentration: 542 ppm - based on 115 ppm 96 hr TL_m to fathead minnow for Zr ion[1]

Saltwater Critical Concentration: 542 ppm - approximated from freshwater data

ZIRCONIUM OXYCHLORIDE - $ArOCl_2.8H_2O$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/l): sol. (50,000)

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: May precipitate in zirconium oxide form

Mammalian Toxicity (mg/Kg body wt): 3500 rat (oral)[11]

Freshwater Critical Concentration: 966 ppm - 96 hr TL_m bluegill[1]

Saltwater Critical Concentration: 966 ppm - approximated from freshwater data

ZIRCONIUM POTASSIUM FLUORIDE - $ZrF_4.KF$

Shipping Forms: Pure

Specific Gravity: >1.0

Solubility (mg/ℓ): sol. (50,000)

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Hydroxide precipitates

Mammalian Toxicity (mg/Kg body wt):

Freshwater Critical Concentration: 7.2 ppm - based on 6.7 ppm 48 hr LC_{50} to rainbow trout for NaF[11]

Saltwater Critical Concentration: 284 ppm - based on 115 ppm 96 hr TL_m to fathead minnow for $ZrSO_4$[1]

ZIRCONIUM SULFATE - $Zr(SO_4)_2.4H_2O$

Shipping Forms: Pure

Specific Gravity: 3.22

Solubility (mg/ℓ): 525,000

Vapor Pressure (mm Hg @_____°C): Negligible

Environmental Half Life: Hydroxide salt will precipitate

Mammalian Toxicity (mg/Kg body wt): 1253 rat (oral)[118]

Freshwater Critical Concentration: 449 ppm - based on 115 ppm 96 hr TL_m fathead minnow[1] for Zr ion in sulfate salt[1]

Saltwater Critical Concentration: 449 ppm - approximated from freshwater data

ZIRCONIUM TETRACHLORIDE - $ZrCl_4$

Shipping Forms: Pure

Specific Gravity: 2.8

Solubility (mg/ℓ): Decomposes

Vapor Pressure (mm Hg @_____°C):

Environmental Half Life: Decomposes in water to ziconium oxychloride

Mammalian Toxicity (mg/Kg body wt): 1688 rat (oral)[94]

Freshwater Critical Concentration: 145 ppm - based on 46 ppm 96 hr TL_m to bluegill for HCl by-product[1]

Saltwater Critical Concentration: 677 ppm - based on 215 ppm 48 hr LC_{50} + shrimp for HCl by-product[1]

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133. Das, M., and P. H. Needham. "Effect of Time and Temperature on Toxicity of Insecticides," Ann. Appl. Biol., 49 (1): 32-38 1961.

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APPENDIX B

SPECIFIC EVALUATION PROCEDURES EMPLOYED TO DERIVE VALUES FOR VOLUMES OF FRESHWATER LAKES AND SURFACE AREAS OF ESTUARINE SYSTEMS

The following appendix includes the original notes and references employed in developing Figures IV-4 and IV-7, respectively. The number of the entry corresponds with the identifying number given in these figures. All values were reduced to present worth quantities for the purpose of comparison.

NOTES TO FIGURE IV-4

1. POND LICK LAKE, OHIO

   - Value is based on the amount expended to rehabilitate the lake after an intentional pesticide spill, $150,000. $177,000 in 1973 dollars.

   - Volume of lake was measured at 56,700 cubic meters (46 acre-feet).

   - References: Ryckman, Edgerly, Tomlinson and Associates, Inc., "Pesticide Poisoning of Pond Lick Lake, Ohio--Investigation and Resolution, June 2-July 5, 1971," EPA, OHM 71-06-002, 1971.

     Personal Communication, Dr. C. H. Thompson, Director, Hazardous Materials Branch, Division of Oil and Hazardous Materials, EPA, January 1974.

2. LAKE TAHOE, CALIFORNIA-NEVADA

   - Value is based on the present worth (infinite life, 6 percent) of total capital and operating cost expenditures for proposed treatment facilities ($100,000,000 capital costs, $1800/day operating)--$132,000,000, and the present worth of income foregone through implementation of the sediment control program by the Tahoe Regional Planning Authority. The latter limited projected living unit and hotel capacities from 750,000 to 300,000 people. Hence, in the long run, income from 450,000 individuals--either full-time residents or vacationers--was foregone. If this growth occurred uniformly over a 10-year period and each unit capacity meant $5000 to the region, the total present worth (10 years, 6 percent) would be $7,800,000,000 in 1973 dollars.

   - Volume of Lake Tahoe is 1.5×10^5 million cubic meters (122×10^6 acre-feet).

   - References: Personal Communication, Russell Culp, Manager, South Lake Tahoe Wastewater Treatment Plant, February 20, 1974.

     Personal Communication, Greg Hanson, Manager, Tahoe Regional Authority, March 25, 1974.

     Personal Communication, Wally White, Real Estate Agent, Incline Village, Nevada, March 14, 1974.

3. PINE LAKE, WASHINGTON

- Value is based on bond levy cost of $100,000 in 1971 dollars.
- Volume is approximately 1.6 million cubic meters (1300 acre-feet) if average depth is assumed at 4.7 meters (15.5 feet) for the 34 hectares (84 acres) of water surface.
- Reference: Personal Communication, Dr. M. W. Lorenzen, Senior Research Engineer, Battelle-Northwest, February 22, 1974.

4. LAKE WASHINGTON, SEATTLE

- Value is based on present worth (infinite life, 6 percent) of total expenditures incurred to divert and treat sewage otherwise discharged to Lake Washington, $3,000,000/year. Value is $50,000,000 in 1973 dollars.
- Volume of the lake is 2.5×10^3 million cubic meters (2×10^6 acre-feet).
- References: Ibid.

  Assorted brochures published by the Seattle Metro organization.

5. MISSISSIPPI MINNOW POND, MISSISSIPPI

- Value is based on damages granted by court when release of sewage destroyed the ponds productivity for a several year period--$30,000.
- Volume of 0.22 million cubic meters (180 acre-feet) was obtained by assuming a 0.9-meter (3-foot) depth for the 24 hectares (59 acres) of pond. $41,700 in 1973 dollars.

6. LAKE ERIE

- Value is based on the present worth (infinite life, 6 percent) of capital ($1,400,000,000 in U.S. and $200,000,000 in Canada) and operating costs ($200,000,000/year in U.S. and $30,000,000/year in Canada)--$5,500,000,000 required to meet desired water quality levels. $7,150,000 in 1973 dollars.
- Volume reported as 4×10^5 million cubic meters (3.4×10^8 acre-feet).

- Reference: "Lake Erie Report--A Plan for Water Pollution Control," U.S. Department of Interior, FWPCA, August 1968.

7. LAKE ONTARIO

- Value is based on the present worth (infinite life, 6 percent) of capital ($1,400,000,000 in U.S. and $200,000,000 in Canada) and operating ($200,000,000/year in U.S. and $30,000,000/year in Canada)--$5,500,000,000 required to meet desired water quality levels. $7,150,000 in 1973 dollars.

- Volume is reported as 1.7×10^6 million cubic meters 1.4×10^9 acre-feet).

- Reference: "Pollution of Lake Erie, Lake Ontario, and the International Section of the St. Lawrence River," International Joint Commission Canada and United States, 1970.

8. GLEN LAKE, VERMONT

- Value is based on valuation made prior to purchase by the Nature Conservancy, $2,000,000. $2,260,000 in 1973 dollars.
- Volume was determined from estimated 9.1-meter (30 foot) depth and charted surface area of 83 hectares (205 acres), 7.6 million cubic meters (6150 acre-feet).

- References: Personal Communication, Jack Lynn, The Nature Conservancy, March 7, 1974.

  Personal Communication, Vermont Department of Forests and Parks, March 8, 1974.

9. MILL POND, MARION, WISCONSIN

- Value is based on the cost of a clean-up program instituted to restore water quality, $100,000. $118,000 in 1973 dollars.
- Volume was derived by assuming an average 3-meter (10-foot) depth for the 40 nectares (100 acres), 1.2 million cubic meters (1000 acre-feet).

- Reference: Personal Communication, Tom Wirth, Wisconsin Department of Environmental Resources, March 8, 1974.

10. LAKE ONONDAGA, NEW YORK

- Value is based on the present worth (infinite life, 6 percent) for the estimated annual social benefits ($3,000,000/year), $50,000,000. $61,000,000 in 1973 dollars.
- Volume is based on a surface area of 1036 hectares (2560 acres) and an average depth of 12.8 meters (42 feet), 133 million cubic meters (107,520 acre-feet).
- Reference: "Benefits of Water Quality Enhancement," EPA 16/10 DAJ 12/70, Civil Engineering Department, Syracuse University, December 1970.

11. WILLIAM SYMINGTON LAKE, WASHINGTON

- Value is based on construction cost estimate, $230,000. to construct the lake. $327,000 in 1973 dollars.
- Volume is that recorded in state records, 0.86 million cubic meters (700 acre-feet).
- Reference: Personal Communication, William Symington, Land Developer, March 13, 1974.

12. LAKE TOHAPEKALIGA, FLORIDA

- Value is that estimated for the entire fisheries resource, $20,000,000. $24,400,000 in 1973 dollars.
- Volume is reported by State Fisheries Agency as 197 million cubic meters (160,000 acre-feet).
- Reference: Personal Communication, John Woods, Chief Freshwater Fisheries Division, Florida State Fish Commission, March 15, 1974.

13. TROUT LAKE, MINNESOTA

- Value is based on the purchase price, $2,000,000 in 1973 dollars.
- Volume was derived from USGS topography maps as 79 million cubic meters (64,000 acre-feet).
- Reference: Personal Communication, George Campbell, Forester, Chippewa National Forest, March 13, 1974.

14. BEAVER LAKE, MINNESOTA

- Value is based on the purchase price, $24,000. $28,300 in 1973 dollars.
- Volume was derived from USGS topography maps as 0.76 million cubic meters (620 acre-feet).
- Reference: Ibid.

15. HORSESHOE LAKE, WISCONSIN

- Value is based on the cost of a eutrophication control program, $38,100. $46,500 in 1973 dollars.
- Volume is reported as 0.46 million cubic meters (375 acre-feet).
- Reference: op. cit. 9.

16. SNAKE LAKE, WISCONSIN

- Value is based on cost of restoration program, $15,640. $19,100 in 1973 dollars.
- Volume is reported as 0.11 million cubic meters (91 acre-feet).
- Reference: op. cit. 9.

17&18. COST OF PROPOSED RESERVOIRS, PENNSYLVANIA

- Value is based on the average cost estimate for a moderate system reservoir ($26,800,000) and an elaborate system reservoir ($26,500,000). $38,100,000 and $37,100,000 in 1973 dollars respectively.
- Volume is based on design capacity for the average moderate system reservoir 145 million cubic meters (118,000 acre-feet) and the average elaborate system reservoir 200 million cubic meters (162,000 acre-feet).
- Reference: "A Dynamic Model of the Economy of the Susquehanna River Basin," Battelle Memorial Institute for the Susquehanna River Basin Utility Group, August 1966.

19. LEWIS AND CLARK RESERVOIR, SOUTH DAKOTA

- Value is present worth (infinite life, 6 percent) of estimated annual recreational value ($1,400,000 in 1960), $23,400,000. $33,200,000 in 1973 dollars.

- Volume is reported as 678 million cubic meters (550,000 acre-feet).

- Reference: Clawson, M. and J. L. Knetsch, Economics of Outdoor Recreation, John Hopkins Press, Baltimore, Maryland, 1966.

20. ODELL LAKE, OREGON

- Value is present worth (infinite life, 6 percent) of reported recreational value for 1967 ($151,455/yr)--$2,500,000. Lake is considered to be one of the less used recreation lakes in Oregon and, hence, is undervalued considerably due to its location. $3,250,000 in 1973 dollars.

- Volume is based on an estimated depth of 40.8 meters (134 feet) for the 1457 hectares (3600 acres) of water, 596,000 cubic meters (482,400 acre-feet).

- Reference: Reiling, S. D., K. C. Gibbs, and H. H. Stoevener, "Economic Benefits From an Improvement in Water Quality," EPA, EPA-R5-73-008, January 1973.

21. KLAMATH LAKE, OREGON

- Value is based on the present worth (infinite life, 6 percent) of the estimated annual recreational value ($82,035/year)--$1,100,000. This lake is also considered undervalued because of its poor water quality. $1,430,000 in 1973 dollars.

- Volume is reported as 925 million cubic meters (750,000 acre-feet).

- Reference: Ibid.

22. RECREATION LAKES, COLORADO

- Value is the present worth (infinite life, 6 percent) of the estimated annual average recreational value ($196,000/year) for recreational lakes constructed in Colorado, $3,300,000 in 1973 dollars.

- Volume is the average capacity of the lakes constructed, 3.3 million cubic meters (2711 acre-feet).

- Reference: Personal Communication, Dave Lemons, Colorado State Wildlife Division, Planning Section, March 13, 1974.

23. LAKE OF THE WOODS, OREGON

- Value is based on the 1968 derived recreational value of $231,704/year or $3,900,000 present worth (infinite life, 6 percent). $5,100,000 in 1973 dollars.
- Volume is recorded as 42 million cubic meters (30,367 acre-feet).
- References: Reiling, S. D., K. C. Gibbs, and H. H. Stoevener, "Economic Benefits From an Improvement in Water Quality," EPA-R5-73-008, January 1973.

  Personal Communication, Ralph Swan, Staff Biologist, Oregon Wildlife Commission, March 25, 1974.

24. WILLOW LAKE, OREGON

- Value is based on the present worth (infinite life, 6 percent) of the 1968 derived recreational value of $53,641/year or $900,000. $1,170,000 in 1973 dollars.
- Volume is reported to be 12 million cubic meters (10,000 acre-feet).
- References: Ibid.

25. DUNCAN RESERVOIR, OREGON

- Value of $95,000 is the actual cost of construction. $132,000 in 1973 dollars.
- Volume is the design capacity of the reservoir, 0.35 million cubic meters (284 acre-feet).
- Reference: Personal communication, Mr. Gilson, Federal Aid Division, Fisheries and Wildlife Service, Bureau of Sport Fisheries, Portland Office, March 28, 1974.

26. LOWER ST. REGIS LAKE, NEW YORK

- Value is based on the capital cost, $50,000, and the present worth (infinite life, 6 percent) of $500/year operating costs for secondary and tertiary treatment plants to maintain water quality: $58,000. This value is also considered to be low. $68,400 in 1973 dollars.
- Volume is reported as 24 million cubic meters (19,214 acre-feet).
- Reference: Ibid.

27. CANADARAGO LAKE, NEW YORK

- Value is based on capital costs, $500,000, and the present worth (infinite life, 6 percent) of $19,000/year operating costs for secondary and tertiary treatment plants to maintain water quality: $817,000. This value is also considered to be low. $964,000 in 1973 dollars.
- Volume is reported as 57 million cubic meters (46,533 acre-feet).

- Reference: Ibid.

28. ALABAMA FISHING LAKES

- Value is the present worth (infinite life, 6 percent) of the $711/acre/year estimated expenditures for fishing in 20 artificial lakes constructed and maintained by the State of Alabama: $21,000,000. $25,620,000 in 1973 dollars.

- Volume is based on an average depth of 2.29 meters (7.5 feet) and an average area of 35 hectares (87 acres) for each of the 20 lakes: 16 million cubic meters (13,000 acre-feet).

- Reference: Sullivan, C. R. "Economic and Social Significances of Sport Fishing," National Conference On Complete WateReuse, AIChE-EPA Technology Transfer Series, April 23-27, 1973.

29. SPORT FISHING IN NEW MEXICO

- Value is the present worth (infinite life, 6 percent) of the $3,960,000 annual expenditures for sport fishing on New Mexican reservoirs: $66,000,000. $101,000,000 in 1973 dollars.
- Volume is 188 million cubic meters (152,825 acre-feet) of reservoir water.

- Reference: Wollman, N., et al. The Value of Water in Alternative Uses, University of New Mexico Press, Albuquerque, 1962.

30. WINTON WOODS RESERVOIR, OHIO

- Value is the present worth (infinite life, 6 percent) of the $1,360,000 annual recreation value of the lake: $23,000,000. $31,300,000 in 1973 dollars.

- Volume is reported as 5.7 million cubic meters (4600 acre-feet).

- Reference: Colorado State University, "Economic Value of Water," National Water Commission, NTIS PB-210 356, March 1972.

31. CAYUGA LAKE, NEW YORK

- Value is the present worth (infinite life, 6 percent) of the $20/acre-foot estimated annual recreation value: $2,800,000,000. $3,420,000 in 1973 dollars.

- Volume is estimated at 1×10^5 million cubic meters (8,400,000 acre-feet) based on a surface area of 17,000 hectares (66 square miles) and an estimated average depth of 61 meters (200 feet).

- Reference: Ibid.

NOTES TO FIGURE IV-7

1. TOTAL ANNUAL HARVEST

   - Value is based on the present worth of the annual income from commercial fishing ($750,000,000/yr) sport fishing ($800,000,000/yr), and recreation ($150,000,000/yr). An infinite life series at 6 percent interest was employed (conversion factor--16.7). This yields a total present worth of $27,500,000,000. $38,200,000 in 1973 dollars.

   - Area was set at 12,000,000 hectares (30,000,000 acres).

   - Reference: "The National Estuarine Pollution Study," FWPCA, November 1969.

2. GREAT BAY, NEW HAMPSHIRE

   - Value is based on the present worth (infinite life, 6 percent) of $2,000,000 annual harvest, or $33,400,000. $46,400,000 in 1973 dollars.

   - This value is reported for 1139 hectares (2815 acres) of shellfish beds. This point falls below the general trend because only the producing beds were evaluated. If the total estuary had been included, the value would raise slightly, and the acreage considerably. This would put the point more in line with the other values.

   - Reference: Ibid.

3. MARISH AND GREAT SOUTH BAY, LONG ISLAND

   - Value is based on the present worth (infinite life, 6 percent) of annual income of $5,000,000 for shellfish and $5,000,000 for sport fishing, or $167,000,000. $232,000,000 in 1973 dollars.

   - Area covered is 28,000 hectares (70,000 acres).

   - Reference: Ibid.

4. APALACHICOLA, FLORIDA

   - Value is based on present worth (infinite life, 6 percent) of annual receipts which average $1[illegible],200,000. Hence, the total value is given as $187,000,000. $260,000,000 in 1973 dollars.

- Area is approximately 53,000 hectares (132,000 acres).
- Reference: Ibid.

5. ALABAMA ESTUARIES

- Value is based on present worth (infinite life, 6 percent) of $18,600,000 annual receipts, or $311,000,000. $404,000,000 in 1973 dollars.
- Area is given as 223,000 hectares (550,000 acres).
- Reference: Ibid.

6. YAQUINA BAY, OREGON

- Value is based on present worth (infinite life, 6 percent) of annual sport fishing income, $317,000, or $5,300,000. $5,990,000 in 1973 dollars.
- Area involved is 1214 hectares (3000 acres).
- Reference: "A Case Study of Yaquina Bay, Oregon," Oregon State University Agricultural Experiment Station, Corvallis, Oregon, February 1972.

7. CHESAPEAKE BAY

- Value is based on present worth (infinite life, 6 percent) of annual commercial harvest ($65,000,000) and estimated sports activity ($65,000,000), or a total of $2,100,000,000. $2,850,000,000 in 1973 dollars.
- Area is 1,900,000 hectares (4,600,000 acres).
- Reference: op. cit. 5. Estimate of sports activity based on ratios observed in other nearby estuarine systems and the national total.

8. PENOBSCOT BAY

- Value is based on the present worth (infinite life, 6 percent) of the $7,500,000 annual primary and secondary harvest: $125,000,000. $174,000,000 in 1973 dollars.
- Area is reported as 21,000 hectares (51,900 acres).
- Reference: Op. Cit. 1.

9. ALBEMARLE, PINALICO, AND CURRITUCK BAYS, NORTH CAROLINA

- Value is based on the present worth (infinite life, 6 percent) of the estimated $15,000,000 annual harvest: $250,000,000. $383,000,000 in 1973 dollars.
- Area is reported as 670,000 hectares (1,648,000 acres).
- References: Op. Cit. 1.

  Personal Communication, Dr. Chestnut, University of North Carolina Oceanographic Institute, March 28, 1974.

10. ESTUARINE SYSTEM OF THE STATE OF GEORGIA

- Value based on present worth (infinite life, 6 percent) of the $17,000,000 annual expenditures for sport and commercial fishing: $284,000,000. $369,000,000 in 1973 dollars.
- Area is reported as 193,000 hectares (476,000 acres).
- References: Battelle Memorial Institute, "The Economic and Social Importance of Estuaries," Environmental Protection Agency, April 1971.

  Personal Communication, Rick Linthurst, Sudaway Island Oceanographic Institute, Sapdo Island, Georgia, March 28, 1974.

11. DELAWARE BAY

- Value is the present worth (infinite life, 6 percent) of the estimated $483/acre/year estuarine value: $570,000,000. $695,000,000 in 1973 dollars.
- Area is reported as 29,000 hectares (70,500 acres).
- Reference: Stroud, R. H. (ed). "Estuary Values," Sport Fisheries Institute, Bulletin No. 213, April 1970.

APPENDIX C

TABLE OF INTRINSIC ADJUSTMENT FACTORS FOR THE RESOURCE VALUE METHODOLOGY

The following table denotes the persistency classification and the physical/chemical classification for designated hazardous substances with respect to selection of adjustment factors for the Resource Value Methodology. The individual Anf (annuity factors) and Disp (dispersion factors) are also presented. Entries for pesticides have been split to allow differentiation between pure and wettable forms. When materials decompose on contact with water, the physical/chemical classification is that of the more toxic hydrolysis product. Similarly, for inorganic salts, classifications refer to the more toxic ion. These notes and descriptions of the symbols employed in the table appear in the legend on page III-125.

KEY TO TABLE OF INTRINSIC ADJUSTMENT FACTORS FOR THE RESOURCE VALUE METHODOLOGY

PERSISTENCY CLASSIFICATIONS

OB = Organic Bioconcentrative
OP = Organic Persistent
OD = Organic Degradable
IB = Inorganic Bioconcentrative
IN = Inorganic Nonbioconcentrative

PHYSICAL/CHEMICAL CLASSIFICATIONS

M = Miscible - liquids with sol.>1,000,000 ppm, or highly soluble materials with specific gravity = 1.0
SM = Soluble Mixer - sol.>1,000,000 ppm, solids
P = Precipitates
IVF = Insoluble Volatile Floater - specific gravity<1.0, vapor pressure>10 mm Hg, soluble<1000 ppm (solubility limit is flexible upward with higher vapor pressures)
INF = Insoluble Nonvolatile Floater - specific gravity<1.0, vapor pressure<10 mm Hg, soluble<1000 ppm
SF = Soluble Floater - sol.>1000 ppm, specific gravity<1.0
SS = Soluble Sinker - sol.>1000 ppm, specific gravity>1.0
IS = Insoluble Sinker - sol.<1000 ppm, specific gravity>1.0

Pure / Wettable = Entry for pesticides is split to allow for variance in classification based on the pure chemical and the commercial formulation (i.e., wettable application forms).

When material decomposes in water, physical/chemical classification is that of product.

For inorganic salts, rating refers to toxic ion.

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Acetaldehyde	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Acetic acid	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Acetic anhydride	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Acetone cyanohydrin	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Acetyl bromide	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Acetyl chloride	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Acrolein	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Acrylonitrile	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Adiponitrile	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Aldrin	OB	0.25	0.11	0.25	0.11	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.41 / 0.59
Allyl alcohol	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Allyl chloride	OD	0.11	0.06	0.16	0.06	IVF	0.31	0.31	0.27	0.35
Aluminum fluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
[illegible]minum sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Ammonia	IN	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Ammonium acetate	IN	0.11	0.06	0.16	0.06	SN	0.84	0.80	0.84	0.78
Ammonium benzoate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59

Hazardous Material	Persistency Classification	Ref - Aemmity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Ammonium bicarbonate	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium bichromate	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium bifluoride	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium bisulfite	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium bromide	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium carbamate	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium carbonate	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium chloride	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium chromate	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium citrate	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium fluoborate	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium fluoride	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59
Ammonium formate	IN	0.11	0.06	0.16	0.06	SM	0.04	0.08	0.84	0.78
Ammonium hydroxide	IN	0.11	0.06	0.16	0.06	SP	0.06	0.06	0.82	0.86
Ammonium hypophosphite	IN	0.11	0.06	0.16	0.06	SS	0.03	0.05	1.05	0.59

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Ammonium iodide	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Ammonium molybdate	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Ammonium nitrate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Ammonium oxalate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Ammonium pentaborate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Ammonium persulfate	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Ammonium silicofluoride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Ammonium sulfamate	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Ammonium sulfate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Ammonium sulfide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Ammonium sulfite	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Ammonium tartrate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Ammonium thiocyanate	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Ammonium thiosulfate	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Amyl acetate	OD	0.11	0.06	0.16	0.06	INP	0.74	0.62	0.60	0.94
Aniline	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Antimony pentachloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Antimony pentafluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Antimony potassium tartrate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Antimony tribromide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Antimony trichloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Antimony trifluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Antimony triiodide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Antimony trioxide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Arsenic acid	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Arsenic disulfide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Arsenic pentoxide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Arsenic tribromide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Arsenic trichloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Arsenic trifluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Arsenic triiodide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Arsenic trioxide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Arsenic trisulfide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Benzene	OD	0.11	0.06	0.16	0.06	IVF	0.31	0.31	0.27	0.35
Benzoic acid	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Benzonitrile	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Benzoyl chloride	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Benzyl chloride	OD	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Beryllium chloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Beryllium fluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Beryllium hydroxide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Beryllium nitrate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Beryllium sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Brucine	OD	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Butyl acetate	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Butyl amine	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Butyric acid	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Cadmium acetate	IB	0.25	0.11	0.25	0.11	SS	0.73	0.71	1.3	0.55
Cadmium bromide	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Cadmium chloride	IB	0.25	0.11	0.25	0.11	P	0 73	0.71	1.3	0.55
Cadmium nitrate	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Cadmium sulfate	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Calcium arsenate	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Calcium arsenite	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Calcium carbide	IN	0.11	0.06	0.16	0.06	P	0.73	0.73	1.3	0.55
Calcium chromate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Calcium cyanide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Calcium dodecylbenzenesulfonate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Calcium hydroxide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Calcium hypochlorite	IN	0.11	0.06	0.16	0.06	SN	0.84	0.80	0.84	0.78
Calcium oxide	IN	0.11	0.06	0.16	0.06	SN	0.84	0.80	0.84	0.78
Captan	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Carbon disulfide	OP		0.06	0.21	0.11	SS	0.83	0.85	1.05	0.59
Catechol	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Chlordane	OB	0.25	0.16	0.25	0.11	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Chlorine	IN	0.11	0.06	0.16	0.06	SP	0.86	0.86	0.82	0.86

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Chlorobenzene	OP	0.16	0.06	0.21	0.11	IS	0.59	0.58	1.35	0.43
Chloroform	OP	0.16	0.06	0.21	0.11	IS	0.59	0.58	1.35	0.43
Chlorosulfonic acid	IN	0.11	0.06	0.16	0.11	SS	0.83	0.85	1.05	0.59
Chromic acetate	IN	0.11	0.06	0.16	0.11	SS	0.83	0.85	1.05	0.59
Chromic acid	IN	0.11	0.06	0.16	0.11	SM	0.84	0.80	0.84	0.78
Chromic sulfate	IN	0.11	0.06	0.16	0.11	SS	0.83	0.85	1.05	0.59
Chromous carbonate	IN	0.11	0.06	0.16	0.11	IS	0.59	0.58	1.35	0.43
Chromous chloride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Chromous oxalate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Chromyl chloride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Cobaltous acetate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous bromide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous chloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous citrate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous fluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous formate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Cobaltous iodide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous nitrate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous perchlorate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous succinate	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Cobaltous sulfamate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cobaltous sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Coumaphos	OD	0.11	0.06	0.16	0.06	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Cresol	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Cupric acetate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric acetoarsenite	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Cupric acetylacetonate	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Cupric bromide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric chloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric formate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric gluconate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric glycinate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Cupric lactate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric nitrate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric oxalate	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Cupric subacetate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric sulfate ammoniated	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Cupric tartrate	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Cuprous bromide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Cuprous iodide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Cyanogen chloride	IN	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Cyclohexane	OD	0.11	0.06	0.16	0.06	IVF	0.31	0.31	0.27	0.35
2,4-D (acid)	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
2,4-D (esters)	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Dalapon	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
DDT	OB	0.25	0.16	0.25	0.11	INF/SF	0.74 / 0.86	0.62 / 0.86	0.60 / 0.82	0.94 / 0.86
Diazinon	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Dicamba	OP	0.16	0.06	0.21	0.11	SS	0.83	0.85	1.05	0.59
Dichlobenil	OP	0.16	0.06	0.21	0.11	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Dichlone	OP	0.16	0.06	0.21	0.11	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Dichlorvos	OP	0.16	0.06	0.21	0.11	SS	0.83	0.85	1.05	0.59
Dieldrin	OB	0.25	0.16	0.25	0.11	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Diethylamine	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Dimethylamine	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Dinitrophenol	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Diquat	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Disulfoton	OD	0.11	0.06	0.16	0.06	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Diuron	OP	0.16	0.06	0.21	0.11	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Dodecylbenzenesulfonic acid	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Dursban	OD	0.11	0.06	0.16	0.06	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Endosulfan	OD	0.11	0.06	0.16	0.06	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Endrin	OB	0.25	0.16	0.25	0.11	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59
Ethion	OD	0.11	0.06	0.16	0.06	IS/SS	0.59/0.83	0.58/0.85	1.35/1.05	0.43/0.59

Hazardous terial	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Ethylbenzene	OD	0.11	0.06	0.16	0.06	INP	0.74	0.62	0.60	0.94
Ethylenediamine	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
EDTA	OP	0.16	0.06	0.21	0.11	IS	0.59	0.58	1.35	0.43
Ferric ammonium citrate	IN	0.11	0.06	0.16	0.11	P	0.73	0.71	1.3	0.55
Ferric chloride	IN	0.11	0.06	0.16	0.11	P	0.73	0.71	1.3	0.55
Ferric fluoride	IN	0.11	0.06	0.16	0.11	P	0.73	0.71	1.3	0.55
Ferric nitrate	IN	0.11	0.06	0.16	0.11	P	0.73	0.71	1.3	0.55
Ferric phosphate	IN	0.11	0.06	0.16	0.11	IS	0.59	0.58	1.35	0.55
Ferric sulfate	IN	0.11	0.06	0.16	0.11	P	0.73	0.71	1.3	0.55
Ferrous ammonium sulfate	IN	0.11	0.06	0.16	0.11	P	0.73	0.71	1.3	0.55
Ferrous chloride	IN	0.11	0.06	0.16	0.11	P	0.73	0.71	1.3	0.55
Ferrous oxalate	IN	0.11	0.06	0.16	0.11	IS	0.59	0.58	1.35	0.43
Ferrous sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Formaldehyde	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Formic acid	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Fumaric acid	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Furfural	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Guthion	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Heptachlor	OB	0.25	0.16	0.25	0.11	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Hydrochloric acid	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Hydrofluoric acid	IN	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Hydrogen cyanide	IN	0.11	0.06	0.16	0.06	SP	0.86	0.86	0.82	0.86
Hydroquinone	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Hydroxylamine	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Isoprene	OD	0.11	0.06	0.16	0.06	IV?	0.31	0.31	0.27	0.35
Isopropanolamine dodecylbenzene-sulfonate	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Kelthane	OP	0.16	0.06	0.21	0.11	IS/SS	0.59 / 0.83	0.59 / 0.85	1.35 / 1.05	0.43 / 0.59
Lead acetate	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Lead bromide	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Lead chloride	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Lead fluoborate	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Lead fluoride	IB	0.25	0.11	0.25	0.11	IS	0.59	0.58	1.35	0.43

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Lead iodide	IB	0.25	0.11	0.25	0.11	IS	0.59	0.58	1.35	0.43
Lead nitrate	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Lead stearate	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Lead sulfate	IB	0.25	0.11	0.25	0.11	IS	0.59	0.58	1.35	0.43
Lead sulfide	IB	0.25	0.11	0.25	0.11	IS	0.59	0.58	1.35	0.43
Lead tetraacetate	IB	0.25	0.11	0.25	0.11	P	0.73	0.71	1.3	0.55
Lead thiocyanate	IB	0.25	0.11	0.25	0.11	IS	0.59	0.58	1.35	0.43
Lead thiosulfate	IB	0.25	0.11	0.25	0.11	IS	0.59	0.58	1.35	0.43
Lead tungstate	IB	0.25	0.11	0.25	0.11	IS	0.59	0.58	1.35	0.43
Lindane	OP	0.16	0.06	0.21	0.11	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Lithium bichromate	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Lithium chromate	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Lithium fluoride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Malathion	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Maleic acid	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Maleic anhydride	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Mercuric acetate	IB	0.25	0.11	1.0	0.11	P	0.73	0.71	1.3	0.55
Mercuric chloride	IB	0.25	0.11	1.0	0.11	P	0.73	0.71	1.3	0.55
Mercuric nitrate	IB	0.25	0.11	1.0	0.11	P	0.73	0.71	1.3	0.55
Mercuric oxide	IB	0.25	0.11	1.0	0.11	IS	0.59	0.58	1.35	0.43
Mercuric sulfate	IB	0.25	0.11	1.0	0.11	P	0.73	0.71	1.3	0.55
Mercuric thiocyanate	IB	0.25	0.11	1.0	0.11	IS	0.59	0.58	1.35	0.43
Mercurous nitrate	IB	0.25	0.11	1.0	0.11	P	0.73	0.71	1.35	0.55
Methoxychlor	OP	0.16	0.06	0.21	0.11	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Methyl mercaptan	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Methyl methacrylate	OD	0.11	0.06	0.16	0.06	IVF	0.31	0.31	0.27	0.35
Methyl parathion	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Mevinphos	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Molybdic trioxide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Monoethylamine	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Monomethylamine	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Naled	OD	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Naphthalene	OP	0.16	0.06	0.21	0.11	IS	0.59	0.58	1.35	0.43
Naphthenic acid	OP	0.16	0.06	0.21	0.11	SS	0.83	0.85	1.05	0.59
Nickel acetate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Nickel ammonium sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Nickel bromide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Nickel chloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Nickel formate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Nickel hydroxide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Nickel nitrate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Nickel sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Nitric acid	IN	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Nitrobenzene	OP	0.16	0.06	0.21	0.11	SS	0.59	0.58	1.35	0.43
Nitrogen dioxide	IN	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Nitrophenol	OP	0.16	0.06	0.21	0.11	SS	0.83	0.85	1.05	0.59
Paraformaldehyde	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Parathion	OP	0.16	0.06	0.21	0.11	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Pentachlorophenol	OP	0.16	0.06	0.21	0.11	IS	0.59	0.58	1.35	0.43
Phenol	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Phosgene	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Phosphoric acid	IN	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Phosphorus	IN	0.11	0.06	0.16	0.06	IS	0.86	0.86	0.82	0.66
Phosphorus oxychloride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Phosphorus pentafluoride	IN	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Phosphorus pentasulfide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Phosphorus trichloride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Polychlorinated biphenyls	OB	0.25	0.16	0.25	0.11	IS	0.59	0.58	1.35	0.43
Potassium arsenate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Potassium arsenite	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Potassium bichromate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Potassium chromate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Potassium cyanide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Potassium hydroxide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Potassium permanganate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Propionic acid	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Propionic anhydride	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Propyl alcohol	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Pyrethrins	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Pyrogallic acid	OP	0.16	0.06	0.21	0.11	SS	0.83	0.85	1.05	0.59
Quinoline	OD	0.11	0.06	0.21	0.06	SS	0.83	0.85	1.05	0.59
Resorcinol	OD	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Selenic acid	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Selenium oxide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sevin	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Sodium	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium arsenate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium arsenite	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium bichromate	IN	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
Sodium bifluoride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Sodium bisulfite	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium chromate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium cyanide	IN	0.11	0.06	0.16	0.06	SN	0.84	0.80	0.84	0.78
Sodium dodecylbenzenesulfonate	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium fluoride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium hydrosulfide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium hydroxide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium hypochlorite	IN	0.11	0.06	0.16	0.06	SN	0.84	0.80	0.84	0.78
Sodium methylate	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium nitrite	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium phosphate (mono-basic)	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium phosphate (di-basic)	IN	0.11	0.06	0.16	0.06	SN	0.84	0.80	0.84	0.78
Sodium phosphate (tri-basic)	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium selenite	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Sodium sulfide	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Strontium chromate	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Strychnine	OD	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Styrene	OD	0.11	0.06	0.16	0.06	IVF	0.31	0.31	0.27	0.35
Sulfuric acid	IN	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Sulfur monochloride	IN	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
2,4,5-T (acid)	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
2,4,5-T (esters)	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Tannic acid	OD	0.11	0.06	0.16	0.06	SM	0.84	0.80	0.84	0.78
TDE	OP	0.16	0.06	0.21	0.11	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Tetraethyl lead	IB	0.25	0.11	0.25	0.11	IS	0.59	0.58	1.35	0.43
Tetraethyl pyrophosphate	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Toluene	OD	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Toxaphene	OB	0.25	0.16	0.25	0.11	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Trichlorfon	OP	0.16	0.06	0.21	0.11	SS	0.83	0.85	1.05	0.59
Trichlorophenol	OD	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Triethanolamine dodecylbenzene-sulfonate	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Triethylamine	OD	0.11	0.06	0.16	0.06	M	1.0	1.0	1.0	1.0
Trimethylamine	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Uranium peroxide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Uranyl acetate	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Uranyl nitrate	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Uranyl sulfate	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Vanadium oxytrichloride	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Vanadium pentoxide	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Vanadyl sulfate	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Vinyl acetate	OD	0.11	0.06	0.16	0.06	SF	0.86	0.86	0.82	0.86
Xylene	OP	0.16	0.06	0.21	0.11	INF	0.74	0.62	0.60	0.94
Xylenol	OD	0.11	0.06	0.16	0.06	SS	0.83	0.85	1.05	0.59
Zectran	OD	0.11	0.06	0.16	0.06	IS/SS	0.59 / 0.83	0.58 / 0.85	1.35 / 1.05	0.43 / 0.59
Zinc acetate	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Zinc ammonium chloride	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Zinc bichromate	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Zinc borate	IN	0.11	0.06	0.16	0.06	P	0.84	0.80	0.84	0.78
Zinc bromide	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc carbonate	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Zinc chloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55

Hazardous Material	Persistency Classification	Anf - Annuity Factor				Physical/ Chemical Classification	Disp - Dispersion Factor			
		Lake	River	Estuary	Coastal Zone		Lake	River	Estuary	Coastal Zone
Zinc cyanide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Zinc fluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc formate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc hydrosulfite	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc nitrate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc permanganate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc phenolsulfonate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc phosphide	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Zinc potassium chromate	IN	0.11	0.06	0.16	0.06	IS	0.59	0.58	1.35	0.43
Zinc propionate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc silicofluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zinc sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zirconium acetate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zirconium nitrate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zirconium oxychloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zirconium potassium fluoride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zirconium sulfate	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55
Zirconium tetrachloride	IN	0.11	0.06	0.16	0.06	P	0.73	0.71	1.3	0.55

APPENDIX D

MATHEMATICAL MODEL DETERMINATION OF THE TOTAL WATER VOLUME SUBJECTED TO A CRITICAL CONCENTRATION FROM A POINT SOURCE SPILL OF A HAZARDOUS MATERIAL

THE BASIC MODEL FOR SPILL INTO LAKES

The volume of water included within a given isoconcentration surface resulting from a point source spill of a completely water miscible substance expands to a maximum value and then declines as dispersion continues. The model employed to derive the Loc, locational dispersion factor, determines the maximum water volume which is subjected to concentrations greater than or equal to the critical concentration. The model is based upon the technique of Wnek and Fochtman[1] wherein eddy diffusion is used as the mechanism of dispersion.

The equation based on this concept, which governs distribution of a pollutant, is given by the partial differential equation

$$\frac{\partial c}{\partial t} + v_x \frac{\partial c}{\partial x} + v_y \frac{\partial c}{\partial y} + v_z \frac{\partial c}{\partial z} =$$

$$\frac{\partial}{\partial x}\left(K_x \frac{\partial c}{\partial x}\right) + \frac{\partial}{\partial y}\left(K_y \frac{\partial c}{\partial y}\right) + \frac{\partial}{\partial z}\left(K_z \frac{\partial c}{\partial z}\right) - R(c) \qquad \text{(D-1)}$$

subject to the initial condition

$$c(x,y,z,0) = 0$$

and the boundary condition of no mass flux across the bounding surface S

$$\frac{\partial c}{\partial n} = 0 \text{ on } S$$

where c is concentration; x,y,z are coordinates measured respectively in the direction of the shore, normal to shore, and

[1]Wnek, W. J. and E. G. Fochtman. "Mathematical Model for the Fate of Pollutants in Near-Shore Waters," Environmental Science and Technology, Vol. 6, No. 4, April 1972.

vertically downward (Figure D-1); t is time; n is normal to S; v_x, v_y, and v_z are velocities for the x,y,z directions, respectively, functions of x,y,z; k_x, K_y, K_z are turbulent dispersion coefficients for x,y,z directions, respectively, functions of x,y,z; and R is rate of reaction of pollutant with its environment. Since the AnF factor has been included to describe degradation of materials, the R-rate of reaction can be dropped from further consideration.

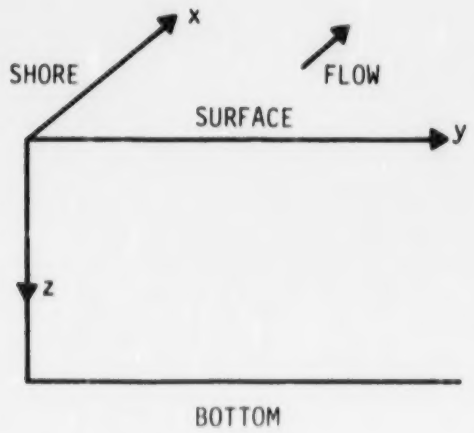

FIGURE D-1. DIAGRAM OF COORDINATE SYSTEM

This equation is arrived at by performing a material balance on a differential element of volume anywhere in the lake. The first term represents local time rate of change of concentration, the next three terms define changes in concentration due to advection, the next three terms account for dispersive action of the pollutant due to turbulence, and the last term allows for depletion of the pollutant due to chemical reaction with its environment.

It was possible to allow for nonconstant dispersion coefficients, relatively complex boundaries such as sloping bottoms, and a three dimensional coordinate system and reduce the computation time by developing an analytical solution by particular transformations and the concept of Green's functions. The model can calculate the amount of pollution due to any number of sources on a lake at any time and point in the shore waters of the lake. The dispersion coefficients, velocities, and reaction term can be arbitrary functions. The model also allows for boundaries such as a lake bottom and shoreline, thermoclines, thermobars, and haloclines (for estuaries).

QUANTITATIVE DESCRIPTION OF MODEL

Eddy diffusion coefficients are characteristic parameters of a given body of water and are empirically determined. Order-of-magnitude estimates can be made from the following correlations.

Longitudinal dispersion means dispersion in the direction of flow. It includes the combined action of turbulence and variation of velocity with position. Diffusivity in longitudinal direction due to flow in the x direction is

$$K_{xo}(ft^2/sec) = c_{Kx} R_H v^*$$

A similar formula for transverse dispersion is

$$K_{yo}(ft^2/sec) = c_{Ky} R_H v^*$$

and for vertical dispersion

$$K_z(ft^2/sec) = c_{Kz} H v^*$$

where

c_{Kx}, c_{Ky}, c_{Kz} = empirical constants for a given body of water whose values are approximately 500, 0.72, and 0.067, respectively

$v^*(ft/sec) = \sqrt{g}\, v_x/N_c$, (shear velocity)

g = gravitational constant

$v_x(ft/sec)$ = inshore velocity in x direction

$N_c = 1.49\, R_H^{0.167}/N_m$ (Chezy coefficient)

$R_H(ft) = HL/2\,(H + L)$ (hydraulic radius)

$H(ft)$ = depth of lake or thermocline

$L(ft)$ = width of lake or thermobar

N_m = Manning's constant ~ 0.025

Similar formulas apply for flow in the y and z directions. To account for the variation of these eddy diffusion coefficients with distance due to transition from small to large eddy motions inherent in homogeneous turbulence, the following correlations

from the oceanography literature may be used. The longitudinal and transverse coefficients decrease with depth according to:

$$\frac{\Delta K_x/\Delta z}{K_{x|surface}} \text{ or } \frac{\Delta K_y/\Delta z}{K_{y|surface}} = -\alpha$$

where

$$\alpha \cong 4.6 \times 10^{-3} \text{ ft}^{-1}$$

Longitudinal and transverse coefficients on the surface increase with distance from the source up to the length scale of large eddy motion

$$K_{x \text{ surface}} = c_s r^{4/3}$$

$$K_{y \text{ surface}} = c_s r^{4/3}$$

where r (ft) = $\sqrt{x^2 + y^2}$ is the absolute distance from the source and

$$1 \times 10^{-4} \leq c_s \leq 2.5 \times 10^{-3} \text{ ft}^{2/3}/\text{sec}$$

For Lake Michigan for example, this length scale is about 800 ft so that for distances greater than 800 ft, diffusivities do not vary. Combining these relationships, the expressions for the eddy diffusion coefficients as functions of the three space variables are

$$K_x = K_{xo} + c_s r^{4/3} (1 - \alpha z)$$

$$K_y = K_{yo} + c_s r^{4/3} (1 - \alpha z)$$

$$K_z = c_{Kz} H v^*$$

Although the model can include flows in more than one direction, these coefficients include only velocity in the x direction, along the shore. The effect of shear is incorporated in K_x so that K_x should be larger than K_y and K_z, since the latter include only the effect of turbulence.

Mean diffusivities are defined as

$$\bar{K}_i = \frac{1}{v_p} \int_{z_o}^{z_p} \int_{y_o}^{y_p} \int_{x_o}^{x_p} K_i(x',y',z')dx'dy'dz'$$

$$i = 1,2,3 \qquad \text{(D-2)}$$

where i = 1,2,3 represents x,y,z. The subscripts o and p denote the source and the point where concentration is desired, respectively. v_p is the volume element equal to $(x_p - x_o)$ $(y_p - y_o)$ $(z_p - z_o)$.

Performing the necessary manipulations the solution to equation (D-1) for an instantaneous point source at x = o, y = o, z = o is

$$c = \frac{M}{8(\pi t)^{3/2}\sqrt{\bar{K}_x\bar{K}_y\bar{K}_z}} \exp\left[-(x - \bar{v}_x t)^2/4\,\bar{K}_x t - (y - \bar{v}_y t)^2/4\,\bar{K}_y t - (z - \bar{v}_z t)^2/4\,\bar{K}_z t\right] \qquad \text{(D-3)}$$

The Green's function is the solution for a unit instantaneous point source released at x',y',z',t' and no decay. Thus,

$$G(x,y,z,t;\, x',y',z',t') = \frac{1}{8[\pi(t - t;)]^{3/2}\sqrt{\bar{K}_x\bar{K}_y\bar{K}z}} X$$

$$\exp\left\{ - \frac{[(x - x') - \bar{v}_x(t - t')]^2}{4\bar{K}_x(t - t')} - \frac{[(y - y') - \bar{v}_y(t - t')]^2}{4\bar{K}_y(t - t')} - \frac{[(z - z') - \bar{v}_z(t - t')]^2}{4\bar{K}_z(t - t')} \right\} \qquad \text{(D-4)}$$

Given a concentration, c, and a spill mass, m, the objective was to determine the location of the surface which enclosed the maximum volume.

It is important to realize that the objective of this formulation was not to predict the concentration of a soluble substance at agiven distance from a constant discharge source, but to determine the maximum volume subjected to the critical or higher concentration of a spill or step input of hazardous material. As such, the problem was not steady state but required

evaluation throughout time. It would be helpful to consider the volume enclosed within the critical concentration surface (three dimensional) as a semi-ellipsoid which expanded with time to a maximum size and then contracted until it disappeared as the hazardous material was diluted to sob critical levels.

Since the final desired result was the maximum volume enclosed within a given isoconcentration surface, a Lagrangian coordinate system was employed. In order to provide a realistic starting point for the model, the point of spill was defined at $x_o = 0$, $y_o = 1$ ft, $z_o = 0$, $t_o = 0$. The resultant equation becomes:

$$C = \frac{M}{8(\pi t)^{3/2}\sqrt{\bar{K}_x \bar{K}_y \bar{K}_z}} \exp\left[- x^2/4\bar{K}_y t - \frac{(y-y_o)^2}{4\bar{K}yt} - z^2/4\bar{K}_z t \right] \qquad \text{(D-5)}$$

The model allowed satisfactory treatment of a relatively complex set of boundary conditions including various angles of bottom descent and several maximum depths by utilizing a series of image sources such as those shown in Figure D-2. The image sources in effect make the boundaries (shoreline, surface and bottom) reflecting surfaces. Each time the plume approaches a boundary, a new image source is added. Thus, the original source can continue to spread with the image source offering the mass that would have been reflected. This is analogous to representing a mirror with a window on the other side of which identical images are placed to match the original source.

For a sloped bottom, if the angle θ is equal to $\frac{\pi}{m}$, where m is a positive integer, the $2\ m^{th}$ image will coincide with the source so that a closed system is obtained. If the source is at the surface the mth image will coincide with the source. Additional image sources with restrictions upon the area affected are required for the situations with a constant maximum depth.

The use of image sources results in a net material transport of zero across the system boundaries. The following figures illustrate two possible paths of hazardous material transport from the source, s. The image sources cause the boundaries to appear as if they were reflecting surfaces which was the desired result. Examples of the action of the image source are given in Figures D-2 and D-3.

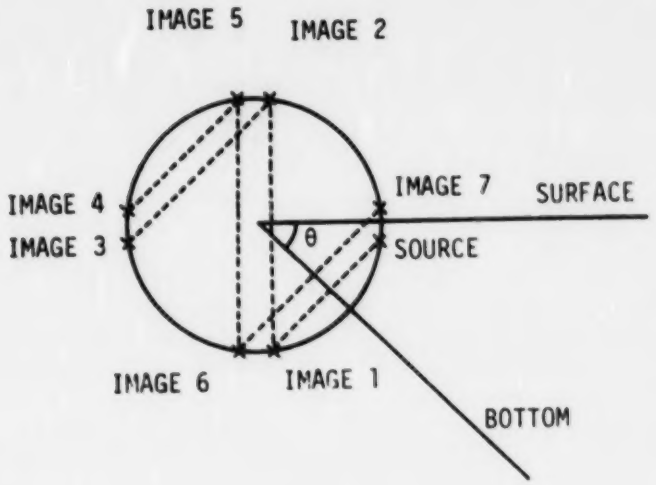

FIGURE D-2. LOCATION OF IMAGES FOR A SLOPING BOTTOM

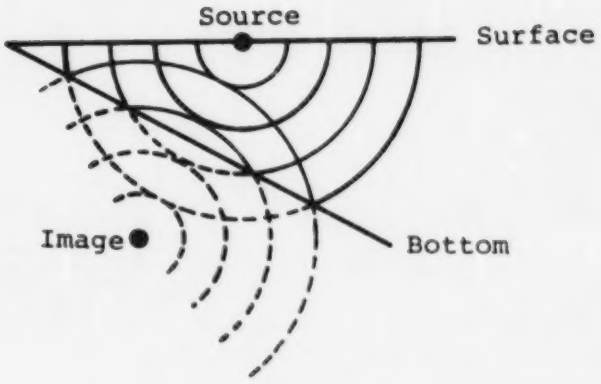

FIGURE D-3. EFFECT OF USING IMAGES TO ACCOUNT FOR REFLECTION OF THE SOURCE TERM

Rearranging equation D-5

$$\frac{c\ 8(\pi t)^{3/2}\sqrt{K_x K_y K_z}}{M} = \sum_{s=1}^{m} \exp\left[\frac{1}{4t}\left(\frac{x^2}{K_x} + \frac{(y-y_s)^2}{K_y} + \frac{(z-z_s)^2}{K_z}\right)\right] \qquad \text{(D-6)}$$

where s corresponds to the actual source or the various image sources. Equation D-6 was solved for y (assuming distance away from shore to be the positive y direction) with x=o and z=o for increasing increments to time, t, until a maximum y was reached. Or in the case of the river model, until a maximum x was reached ($y = y_o$ and $z = o$). Equation D-5 at x=o, z=o and y=ymax defined the time at maximum volume. The various K_s had to be reevaluated at each successive iteration of y. With t (max volume) defined, the volume of the spill was determined by incremental elements of x and z. During the iterative determinations of the various y values of the maximum volume critical concentration surface, the correct value was assumed if the difference between the left and right hand sides of Equation D-6 was smaller than a specified value, ε. Epislon, ε, was defined as $0.01 \times y_1$ where y_1 was the latest value of y in the iterative sequence. When the latest value of y caused the right hand side of the equation to exceed the value of the left side, the step size was halfed and the process repeated. The z direction step size was also reduced by a similar procedure when the maximum depth of the spill was exceeded.

The determination of the maximum value of x at the top surface permitted an initial estimate of the location of the critical concentration surface by assuming each "slice" parallel to the top surface to take the shape of an ellipse. This permitted improved starting values for the iterative calculations of y and consequently reduced computer run time.

Since the spill is symmetrical about the yz plane, only the volume in the positive x direction was calculated and the result multiplied by 2. Also, the spill was assumed to occur at the surface and the three dimensional dispersion was symmetrical about the xy plane, so that the mass, m, actually used in the calculations was 2m and thus the volume obtained was equivalent to that for a spill of mass, m, in the lower half of the ellipsoid, that lying below the water surface, which is the volume of interest. This modification reduced the number of image sources required by a factor of 2, and was possible only because of the assumption that the spill occured at the surface.

The calculation was made assuming a value for Vx of 0.11 kilometers per hour (0.1 fps), and a spill mass in 45.4 kg (100 lbs). The angle of descent and average depth were varied to produce the matrices presented in the accompanying tables for various critical concentration levels. Entries in the matrices are the actual locational variable, Loc, and therefore represent the ratio of the volume predicted by the model and the instantaneous mixing volume to an isoconcentration equivalent to the critical concentration. Hence, for model predicted values (v_p) based on spillage of mass (m) and an isoconcentration surface (cc), the denominator of the ratio is simply

$$V_{max} = m/cc$$

Consequently, the entries in the matrices are

$$Loc = v_p/v_{max}$$

$$= (v_p) \times (cc)/m$$

COASTAL MODEL

The coastal model was a simplified version of the lake model with no image sources for the sloping shoreline, as the spill was assumed to occur relatively far from shore. Since, for this situation, the critical concentration surface was symmetrical about both the xz plane and the yz plane only a quarter of the volume needed to be calculated and the result multiplied by 4. Also, as for the lake model addition, the spill was symmetrical about the xy plane so that twice the given mass of material was supplied to the model but only that portion of the volume lying below the surface was used in determining the final result. One image source was used to assure that the bottom surface boundary was accounted for if the isoconcentration surface reached the bottom.

RIVER MODEL

The lake model was applied to the river situation by utilizing Wards equations to generate a mean velocity $\bar{v}_x$, river width, and river depth. A 45° slope was assumed for each case. In addition to the image sources necessary to establish correct boundary conditions for the sloping shoreline near the spill, a second set of image sources was often necessary to account for the opposite shore boundary. This set was located in the y direction (normal to the shoreline) at a distance of twice the river width minus y_o. In this manner, as the critical concentration surface of the original spill reached the opposite shore boundary, the surface from the extra set of image sources reached the same boundary moving in the opposite direction. Thus, the effect of a reflecting surface was achieved. Wards equations are a set of empirical relationships between flow rate and mean depth, width, and velocity.

$$\text{mean river wepth (ft.)} - w = aQ^b$$

$$\text{mean river depth (ft.)} - d = cQ^f$$

$$\text{mean river velocity (fps)} - v = kQ^m$$

The coefficients a, b, c, f, k, and m are empirical coefficients. The values of these coefficients used in the model are

a = 4.81

b = 0.5

c = 0.16

f = 0.4

k = 1.30

m = 0.10, and

Q is the flow rate in cfs.

ESTUARINE MODEL

No simple model configuration could be derived for the estuarine environment based on only two variables. Rather, models require designation of where in the estuary the spill occured, at what point in the tidal cycle the spill occured, the tributary inflow, the depth to the halocline, and the nature of the estuary, i.e., partially mixed, completely mixed, or stratified. These complications eliminate the benefits to be derived from tabular display of LOC factors as a function of two or less environmental variables. Consequently no factors were derived. It is recommended that the appropriate river or coastal water values be employed instead based on the location of the spill with respect to the importance of current factors.

Model Summary

A. Model as Formulated in the Literature

1. Image source concept allowed simple consideration of relatively complex boundaries.

2. Adjustment of the dispersion coefficients with distance allowed limited response to boundary effects upon dispersion.

B. Model as Formulated by BNW

1. The model permitted the time dependent calculation of a changing volume.

2. The occurrence of maximum volume was determined by the point in time at which the volume began to decrease.

3. The maximum volume was then calculated by a summary series of horizontal "slices".

4. Assumming each slice of the volume to take the shape of a semi-ellipse reduced the computations necessary in the iterative calculation of the critical concentration surface.

5. The computations were reduced by a factor of 4 without impairing the accuracy of the final result by assuming the spill occurred at the surface and that the critical concentration was symetrical about a line passing through the spill point and perpendicular to the shore.

6. Since the maximum critical concentration was desired and not a concentration at some particular distance from the original spill point, a Lagrangian coordinate system was employed. With Lagrangian coordinates the origin is moved with the net flow, for example, in a river. The result in this application greatly simplified the formulation and calculations.

TABLE D-1

LOCATIONAL VARIABLES FOR SPILLS INTO LAKES*

Angle of Descent	Concentration (mg/l)	Average Depth - Meters (Feet) 3 (10)	7.6 (25)	15.2 (50)	30.4 (100)	60.8 (200)	304 (1000)
5	1	.026	.044	.046	.046	.046	.046
	2	.036	.055	.055	.055	.055	.055
	3	.045	.059	.059	.059	.059	.059
	5	.059	.064	.064	.064	.064	.064
	10	.072	.072	.072	.072	.072	.072
10	1	.023	.041	.053	.058	.058	.058
	2	.072		.065	.064	.064	.064
	3	.076	.063	.072	.072	.072	.072
	5	.078	.072	.078	.078	.078	.078
	10		.087	.090	.090	.090	.090
15	1	.076	.036	.048	.060	.061	.061
	2	.073	.047	.060	.071	.071	.071
	3	.075	.053	.070	.075	.075	.075
	5	.074	.064	.082	.088	.088	.088
	10	.087	.083	.100	.102	.102	.102
30	1	.074	.066	.038	.050	.063	.069
	2	.069	.037	.050	.065	.079	.080
	3	.064	.042	.058	.082	.089	.096
	5	.064	.055	.067	.090	.105	.106
	10	.045	.072	.091	.114	.130	.130
45	1	.087	.074	.038	.082	.066	.090
	2	.078	.068	.048	.088	.085	.113
	3	.077	.051	.061	.101	.109	.137
	5	.070	.061	.075		.130	.151
	10	.077	.078	.100	.129	.178	.188
60	1	.033	.058	.082	.111	.127	.061
	2	.026	.052	.073	.124	.049	.082
	3	.024	.050		.101	.056	.084
	5	.021	.050	.082	.115	.070	.103
	10	.0008	.030	.040		.073	

*For multiples of the critical concentrations employed, ratio the Loc factors, e.g., for Loc_{50} take $\frac{Loc_{10}}{Loc_1} \times Loc_5$.

TABLE D-2

LOCATIONAL VARIABLES FOR SPILLS INTO COASTAL WATERS*

Ocean Current (knots/hr)	Concentration (mg/l)	Depth, meters (feet)			
		30.4 (100)	76 (250)	152 (500)	304 (1000)
0.1	1	.234	.241	.244	.247
	2	.238	.244	.250	.252
	3	.239	.245	.251	.254
	5	.242	.248	.254	.256
	10	.249	.254	.260	.261
0.2	1	.192	.203	.212	.219
	2	.188	.200	.210	.220
	3	.192	.204	.211	.221
	5	.194	.206	.214	.224
	10	.200	.213	.223	.231
0.3	1	.156	.171	.180	.191
	2	.152	.166	.175	.187
	3	.155	.168	.178	.188
	5	.158	.170	.183	.193
	10	.166	.178	.188	.199
0.4	1	.131	.145	.155	.166
	2	.126	.140	.149	.160
	3	.130	.142	.151	.162
	5	.132	.145	.155	.167
	10	.138	.152	.161	.175
0.5	1	.113	.126	.136	.146
	2	.109	.120	.130	.141
	3	.109	.124	.132	.143
	5	.114	.126	.134	.146
	10	.121	.131	.143	.152
0.6	1	.098	.110	.119	.130
	2	.095	.106	.115	.125
	3	.098	.108	.118	.126
	5	.101	.113	.120	.131
	10	.108	.117	.128	.137

*For multiples of the critical concentrations employed, ratio the Loc factors, e.g., for Loc 50 take $\frac{\text{Loc } 10}{\text{Loc } 1} \times \text{Loc } 5$

TABLE D-3

LOCATIONAL VARIABLES FOR SPILLS INTO RIVERS

Flow Rate (cfs)	1	2	3	5	10
100	.00278	.00443	.00573	.00801	.0120
250	.00416	.00808	.00746	.0105	.00999
500	.00556	.00876	.0125	.00862	.0238
1,000	.00683	.0102	.0132	.0202	.00919
5,000	.00154	.00140	.00176	.00257	.00364
10,000	.00119	.00159	.00213	.00294	.00490
25,000	.00151	.00235	.00314	.00440	.00717
50,000	.00201	.00321	.00418	.00585	.00942
100,000	.00272	.00409	.00533	.00797	.00593
200,000	.00346	.00570	.00699	.0101	.0156
750,000	.00461	.00600	.00812	.0112	.00825

APPENDIX E

IMCO/GESAMP GUIDELINES FOR PROFILING HAZARDOUS MATERIALS

This appendix contains the IMCO/GESAMP guidelines for profiling hazardous materials in five hazard potential areas:

- Bioaccumulation
- Damage to Living Resources
- Hazard to Human Health, oral intake
- Hazard to Human Health, skin contact and inhalation (solution)
- Reduction of Amenities

Also included in this appendix is a sample page[1] which illustrates the profiling operation.

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[1] "Report of an Ad Hoc Panel of IMCO and GESAMP Experts to Review the Environmental Hazards of Noxious Substances other than Oil Transported by Ships," Joint Group of Experts on the Scientific Aspects of Marine Pollution, London, England, 1073/73.

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LEGEND TO THE HAZARD PROFILES[1]

Column A - Bioaccumulation

+	Bioaccumulated and liable to produce a hazard to aquatic life or human health
0	Not known to be significantly bioaccumulated
Z	Short retention of the order of one week or less
T	Liable to produce tainting of seafood

Column B - Damage to living resources

Ratings		TL_m
4	Highly toxic	<1 ppm
3	Moderately toxic	1-10 ppm
2	Slightly toxic	10-100 ppm
1	Practically nontoxic	100-1000 ppm
0	Nonhazardous	>1000 ppm
BOD	Problem caused primarily by high oxygen demand	
D	Deposits liable to blanket the sea floor	

Column C - Hazard to human health, oral intake

Ratings		LD_{50}
4	Highly hazardous	<5 mg/kg
3	Moderately hazardous	5-50 mg/kg
2	Slightly hazardous	50-500 mg/kg
1	Practically nonhazardous	500-5000 mg/kg
0	Nonhazardous	>5000 mg/kg

Column D - Hazard to human health, skin contact and inhalation (solution)

II	Hazardous (solution)
I	Slightly hazardous (solution)
0	Nonhazardous (solution)

Column E - Reduction of amenities

Ratings

xxx	Highly objectionable because of persistency, smell or poisonous or irritant characteristics; beaches liable to be closed
xx	Moderately objectionable because of the above characteristics, but short-term effects leading to temporary interference with use of beaches
x	Slightly objectionable, no interference with use of beaches
0	No problem

All Columns

Ratings in parentheses ( ) indicate insufficient data available to the Panel on specific substances, hence extrapolation was required.

SAMPLE

HAZARD PROFILE OF SELECTED SUBSTANCES

Substances	Bioaccumulation	Damage to living resources	Hazard to human health		Reduction of amenities	Remarks
			Oral intake	Skin contact and inhalation (solution)		
	A	B	C	D	E	
Acetaldehyde	0	2	1	0	x	
Acetic acid	-	2	0	0	0	
Acetic anhydride	0	2	0	0	0	
Acetone	0	1	0	0	0	
Acetone cyanohydrin	0	4	3	II	xx	
Acetonitrile (methylcyanide)	0	0	1	0	0	
Acetyl chloride	0	2	1	0	0	
Acrolein	T	4	3	I	xxx	
Acrylic acid	0	(2)	1	I	xx	
Acrylic latex	0	?	0	0	xx	? in Column B due to possible presence of unknown inhibitors.
Acrylonitrile	0	3	3	II	xxx	
Adiponitrile	0	1	3	I	x	
Aldrin	-	4	2	I	xxx	
Alkyl benzene sulfonate (straight chain)	0	2	1	0	0	
(branched chain)	0	3	1	0	0	
Allyl alcohol	0	3	2	0	xx	
Allyl chloride	0	2	2	0	xx	
Allyl isothiocyanate	0	(2)	2	II	xx	
Alum (15% solution)	0	1	0	0	0	
Alumina	0	D	0	0	0	
Aluminum phosphide	0	(3)	4	II	0	

SAMPLE

APPENDIX F

IMCO/GESAMP GUIDELINES FOR CATEGORIZING HAZARDOUS MATERIALS

This appendix contains the IMCO/GESAMP[1] guidelines for categorizing hazardous materials on the basis of their hazard profiles (see Appendix E).*

Category A — Substances which are bioaccumulated and liable to produce a hazard to aquatic life or human health, or which are highly toxic to aquatic life (as expressed by a Hazard Rating 4, difined by a TL_m less than 1 ppm); and additionally certain substances which are moderately toxic to aquatic life (as expressed by a Hazard Rating 3, defined by a TL_m of 1 or more, but less than 10 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category B — Substances which are bioaccumulated with a short retention of the order of one week or less, or which are liable to produce tainting of the sea food, or which are moderately toxic to aquatic life (as expressed by a Hazard Rating 3, defined by a TL_m of 1 ppm or more, but less than 10 ppm); and additionally certain substances which are slightly toxic to aquatic life (as expressed by a Hazard Rating 2, defined by a TL_m of 10 ppm or more, but less than 100 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category C — Substances which are slightly toxic to aquatic life (as expressed by a Hazard Rating 2, defined by a TL_m of 10 or more, but less than 100 ppm), and additionally certain substances which are practically non-toxic to aquatic life (as expressed by a Hazard Rating 1, defined by a

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[1] "Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk, Annex II," International Conference on Marine Pollution, October 31, 1973.

*These categories are used under the IMCO convention to determine operational discharge requirements for ships transporting hazardous materials.

TL_m of 100 ppm or more, but less than 1,000 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category D — Substances which are practically non-toxic to aquatic life, (as expressed by a Hazard Rating 1, defined by a TL_m of 100 ppm or more, but less than 1,000 ppm); or causing deposits blanketing the sea-floor with a high biochemical oxygen demand (BOD); or highly hazardous to human health, with an LD_{50} of less than 5 mg/kg; or produce moderate reduction of amenities because of persistency, smell or poisonous or irritant characteristics, possibly interfering with use of beaches; or moderately hazardous to human health, with an LD_{50} of 5 mg/kg or more, but less than 50 mg/kg and produce slight reduction of amenities.

Other Liquid Substances (for the purposes of Regulation 4 of this Annex)

Substances other than those categorized in Categories A, B, C and D above.

In reviewing the guidelines of the IMCO subcommittee, an attempt was made to obtain a precise definition of the expressions "additional factors" and "special characteristics" of the substances. Although a complete clarification of these expressions was not possible, it was determined that they referred in part to a sub-system devised by the committee for considering multiple effects. This sub-system is illustrated in the following table. This table shows that a given hazardous material can be placed in a higher category when its ability to exert multiple effects is considered. For example, the major criteria for Category A substances are bioaccumulation (+ rating) or high aquatic toxicity (4 rating); however, moderately toxic materials (3 rating) which are also tainting to fish (T rating) can also be placed in Category A.

TABLE F-1

SUB-SYSTEM FCR CATEGORIZING HAZARDOUS MATERIAL*

	IMCO/GESAMP Hazard Profile			
	A	B	C	D
Category A	+	-	-	-
	-	4	-	-
	T	3	-	-
	Z	3	-	xxx
Category B	T	-	-	-
	Z	-	-	-
	-	3	-	-
Category C	-	2	-	-
	-	1	4/3	xx
	-	-	-	xxx
Category D	-	1	-	-
	-	-	4	-
	-	-	3	x
	-	D(BOD)	-	xx

*NOTE: This system was developed by the working group at the 1973 International Convention for the Prevention of Pollution from ships. The hazard profile ratings are based on the work of the IMCO/GESAMP ad hoc committee of experts (see Appendix E).

REFERENCES

1. "Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk, Annex II," International Conference on Marine Pollution, October 31, 1973.

APPENDIX G

TABLE OF IMCO METHODOLOGY CLASSIFICATION OF HAZARDOUS MATERIALS

This appendix contains hazard profiles and hazard categories for the hazardous materials. Materials were profiled and categorized in accordance with the IMCO/GESAMP guidelines contained in Appendices E and F. The reader should refer to these appendices for the key to the hazard profile symbols and hazard category definitions.

Physical/chemical profiles are also contained in this appendix. The physical/chemical group symbol (Roman numeral) is used to enter the adjustment factor table in Appendix I.

REFERENCES AND NOTES TO TABLE OF IMCO METHODOLOGY CLASSIFICATION OF HAZARDOUS MATERIALS

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[1]Profile differs from that of IMCO on the basis of data reported in Appendix A.

[2]Category agrees with IMCO category.

[3]Category differs from IMCO category.

[4]This material concentrates in biota, but not to a degree that threatens higher trophic levels and therefore the hazard is not related to bioaccumulation per se.

[5]For material categorized on the basis of long term bioaccumulation potential, the physical/chemical profile is based on the insoluble precipitate which may form over long periods of time in the environment.

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[a]See Appendix E for discussion of symbols used in Hazard Potential Profile.

[b]

NP = Non-persistent	V = Volatile
P = Persistent	NV = Nonvolatile
F = Floats	S = Soluble
M = Mixes	I = Insoluble
SK = Sinks	NOTE: See Appendix I for full description of each of these physical/chemical characteristics.

[c]Hazard potential(s) upon which assignment to category was based are underlined. Hazard potential(s) which, in combination, cause material to be assigned to category are overscored. Parentheses indicate assumed values.

[d]Under "Damage to Living Resources" and "IMCO Category", the diagonal is used to distinguish between freshwater and saltwater values (freshwater value/saltwater value).

[e]See Appendix I for discussion of "Physical/Chemical Groups" and adjustment factors for these groups.

[f]Under "Solubility" and "Physical/Chemical Group", the diagonal is used to distinguish between the pure and wettable form of certain pesticides (pure form/wettable form).

[g]A pesticide with both pure and wettable forms.

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Acetaldehyde	0	2	1	0	X	C^2	NP	F	V	S	VIII
Acetic acid	0	2	1^1	0	0	C^2	NP	M			XII
Acetic anhydride	0	2	1^1	0	0	C^2	NP	M			XII
Acetone cyanohydrin	0	$(2)^1$	T	II	XX	C^3	NP	M			XII
Acetyl bromide	0	(1)	(1)	0	0	D	NP	SK		S	XIII
Acetyl chloride	0	$(1)^1$	1	0	0	D^3	NP	M			XII
Acrolein	T	4	3	I	XXX	A^2	NP	F	V	S	VIII
Acrylonitrile	0	$2^1/(2)^1$	2^1	II	XXX	C^3	NP	F	V	S	VIII
Adiponitrile	0	$1/(1)$	2^1	I	X	D^2	NP	F	MV	S	X
Aldrin[g]	*	4	2	I	XXX	A	P	SK		I/S	VII/VI
Allyl alcohol	0	$(4)^1/(3)$	2	0	XX	A^3/B^2	NP	F	V	S	VIII
Allyl chloride	0	$2^1/1$	1^1	0	XX	C^2/B^3	P	F	V	S	I
Aluminum fluoride	0	$(3)/(1)$	1	0	0	B/D	P	SK		S	VI
Aluminum sulfate	0	$1/(1)$	1^1	0	0	D^2	P	SK		S	VI
Ammonia	0	3	(1)	I	0	B^2	NP	F	V	S	VIII
Ammonium acetate	0	$1/(1)$	(2)	0	0	D	NP	M			XII
Ammonium benzoate	0	(1)	(1)	0	0	D	NP	SK		S	XIII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,g]
Ammonium bicarbonate	0	(2)	(1)	0	0	C	NP	SK		S	XIII
Ammonium dichromate	0[4]	1/(1)	2	0	0	D	NP	SK		S	XIII
Ammonium difluoride	0	1/(1)	(1)	0	0	D	NP	SK		S	XIII
Ammonium bisulfite	0	(1)	(1)	0	0	D	NP	SK		S	XIII
Ammonium bromide	0	(2)	(2)	0	0	C	NP	SK		S	XIII
Ammonium carbamate	0	(3)	(2)	0	0	B	NP	SK		S	XIII
Ammonium carbonate	0	2/(2)	(2)	0	0	C	NP	SK		S	XIII
Ammonium chloride	0	3/(3)	(2)	0	0	B	NP	SK		S	XIII
Ammonium chromate	0[4]	1/(1)	(2)	0	0	D	NP	SK		S	XIII
Ammonium citrate	0	(1)	(1)	0	0	D	NP	SK		S	XIII
Ammonium fluoborate	0	(2)	(1)	0	0	C	NP	SK		S	XIII
Ammonium fluoride	0	1/(1)	2	0	0	D	NP	SK		S	XIII
Ammonium formate	0	(1)	1	0	0	D	NP	SK		S	XIII
Ammonium hydroxide	0	2/(2)	(1)	2	0	C	NP	M			V
Ammonium hypophosphite	0	(3)	(2)	0	0	B	NP	SK		S	XIII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	INCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Ammonium iodide	0	(2)	(1)	0	0	C	NP	SK		S	XIII
Ammonium molybdate	0	(2)	2	0	0	C	NP	SK		S	XIII
Ammonium nitrate	0	(3)[1]	(1)	0	0	B[3]	NP	SK		S	XIII
Ammonium oxalate	0	(1)	(1)	0	0	D	NP	SK		S	XIII
Ammonium pentaborate	0	(2)	(1)	0	0	C	NP	SK		S	XIII
Ammonium persulfate	0	(2)	1	0	0	C	NP	SK		S	XIII
Ammonium silicofluoride	0	2/(2)	(1)	0	0	C	NP	SK		S	XIII
Ammonium sulfamate	0	1/(1)	1	0	0	D	NP	SK		S	XIII
Ammonium sulfate	0	(3)	1	0	0	B	NP	SK		S	XIII
Ammonium sulfide	0	1/(1)	(1)	0	0	D	NP	SK		S	XIII
Ammonium sulfite	0	1/(1)	(1)	0	0	D	NP	SK		S	XIII
Ammonium tartrate	0	(1)	(1)	0	0	D	NP	SK		S	XIII
Ammonium thiocyanate	0	1/(1)	(2)	0	0	D	NP	SK		S	XIII
Ammonium thiosulfate	0	(1)	(1)	0	0	D	NP	SK		S	XIII
Amyl acetate	0	2	(1)[1]	0	X	C[2]	NP	F	MV	I	XI
Aniline	0	2/(2)	1[1]	II	XX	C[2]	NP	M			XII
Antimony pentachloride	0[4]	(2)	4	0	X	C	P	SK		S	VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	INCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Antimony pentafluoride	0[4]	(3)/(2)	(2)	0	X	B/C	P	SK		S	VI
Antimony potassium tartrate	0[4]	2/(2)	2	0	X	C	P	SK		S	VI
Antimony tribromide	0[4]	(2)	(2)	0	X	C	P	SK		S	VI
Antimony trichloride	0[4]	2/(2)	1	0	X	C	P	SK		S	VI
Antimony trifluoride	0[4]	(2)	2	0	X	C	P	SK		S	VI
Antimony triiodide	0[4]	(2)	(2)	0	X	C	P	SK		S	VI
Antimony trioxide	0[4]	(1)[1]	0[1]	0	X	D	P	SK		S	VI
Arsenic acid	±	(2)[1]/3	(3)	3	0	A	P	SK		S	VI
Arsenic disulfide	±	(2)/(3)	(3)	0	0	A	P	SK		I	VII
Arsenic pentoxide	±	(2)[1]/(3)	3	0	0	A	P	SK		S	VI
Arsenic tribromide	±	(2)[1]	(3)[1]	0[1]	0	A	P	SK		S	VI
Arsenic trichloride	±	(2)[1]/(3)	(3)[1]	0[1]	0	A	P	SK		S	VI
Arsenic trifluoride	±	(2)/(3)	(3)	0	0	A	P	SK		S	VI
Arsenic triiodide	±	(2)	(3)	0	0	A	P	SK		S	VI
Arsenic trioxide	±	(2)[1]/(3)	3[1]	0	0[1]	A	P	SK		S	VI
Arsenic trisulfide	±	(2)	(3)	0	0	A	P	SK		I	VII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[a,e]
Benzene	0	2	0[1]	0	X	C[2]	NP	F	V	I	IX
Benzoic acid	0	1/(1)	1	0	0	D	NP	SE		S	XIII
Benzonitrile	0	2/(2)	(2)	II	XX	C	NP	M			XII
Benzoyl chloride	0	(1)	(2)	I	XX	D	NP	M			XII
Benzyl chloride	0	(1)[1]	(2)	I	XX	D[3]	NP	SE		I	XIV
Beryllium chloride	0[4]	(1)[1]	2	0	0	D	P	SE		S	VI
Beryllium fluoride	0[4]	(3)/(2)	(2)	0	0	B/C	P	SE		S	VI
Beryllium hydroxide	0[4]	(2)	(2)	0	0	C	P	SE		I	VII
Beryllium nitrate	0[4]	1/(1)	(2)	0	0	D	P	SE		S	VI
Beryllium sulfate	0[4]	(1)	2	0	0	D	P	SE		S	VI
Brucine	(X)/(X)	(2)[1]/(X)	3	I	0	B/A	P	SE		S	VI
Butyl acetate	0	2[1]	1[1]	0	X[1]	C[3]	NP	F	MV	S	X
Butyl amine	0	2/(2)	1	0	X	C	NP	F	V	S	VIII
Butyric acid	I	1/(1)	1[1]	0	X	B[2]	NP	M			XII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Cadmium acetate	±	(3)	(2)	0	0	A	P	SK		I^S	VII
Cadmium bromide	±	(3)	(2)	0	0	A	P	SK		I^S	VII
Cadmium chloride	±	3^1 / $(2)^1$	2	0	0	A^2	P	SK		I^S	VII
Cadmium nitrate	±	(3)	2	0	0	A	P	SK		I^S	VII
Cadmium sulfate	±	(3)	2	0	0	A	P	SK		I^S	VII
Calcium arsenate	±	(2)	2^1	0	XX	A	P	SK		I	VII
Calcium arsenite	±	(2)	2^1	0	XX	A	P	SK		I^S	VII
Calcium carbide	0	(1)	(1)	0	0	D	NP	SK		S	XIII
Calcium chromate	0^6	(1) / (1)	(2)	0	0	D	P	SK		S	VI
Calcium cyanide	0	(4)	3^1	II	0	A	NP	SK		S	XIII
Calcium dodecylbenzenesulfonate	0	(2)	(1)	0	X	C	NP	SK		S	XIII
Calcium hydroxide	0	1 / (1)	0	0	0	D^2	NP	SK		S	XIII
Calcium hypochlorite	0	$(4)^1$ / (3)	(1)	0^1	X	A/B	NP	SK		S	XIII
Calcium oxide	0	(1)	(0)	0	0	D	NP	SK		S	XIII
Captan	0^1	4 / (4)	(3)	0	XX	A	NP	SK		I/S	XIV / XIII
Carbon disulfide	0^1	1^1 / $(1)^1$	2	I	XXX	C^3	P	SK		S	VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]					IMCO[d] CATEGORY	PHYSICAL/CHEMICAL PROFILE[b]				PHYSICAL/CHEMICAL GROUP[d,f]
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities		Persistence	Behavior	Volatility	Solubility[f]	
Catechol	0	2	1	0	0	C	NP	SK		S	XIII
Chlordane	±	4	2	I	XXX	A	P	SK		I/S	~~VII~~ VI
Chlorine	0	4	NA	II	XX	A[2]	NP	SK		S	XIII[4]
Chlorobenzene	(1)	2[1] / (2)[1]	1	0	X	B[2]	P	SK		I	VII
Chloroform	1	(1)[1]	1	0	XX	B[2]	P	SK		I	VII
Chlorosulfomic acid	0	(2) / (1)[1]	(1)	I	0	C[2] / D[3]	NP	SK		S	XIII
Chromic acetate	0[4]	(3) / (2)	(1)	0	0	B/C	P	SK		S	VI
Chromic acid	0[4]	2[1]	2[1]	0	0	C	P	SK		S	VI
Chromic sulfate	0[4]	(3) / (2)	(1)	0	0	B/C	P	SK		S	VI
Chromous carbonate	0[4]	(3) / (2)	(1)	0	0	B/C	P	SK		S	VI
Chromous chloride	0[4]	(3)	(1)	0	0	B	P	SK		S	VI
Chromous oxalate	0[4]	(3) / (2)	(1)	0	0	B/C	P	SK		S	VI
Chromyl chloride	0[4]	(2) / (1)	(1)	0	0	C/D	P	SK		S	VI
Cobaltous acetate	0[4]	(2) / (1)	(2)	0	0	C/D	P	SK		S	VI
Cobaltous bromide	0[4]	(2) / (1)	(2)	0	0	C/D	P	SK		S	VI
Cobaltous chloride	0[4]	(2) / (1)	(2)	0	0	C/D	P	SK		S	VI
Cobaltous citrate	0[4]	(2) / (1)	(2)	0	0	C/D	P	SK		S	VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	INCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Cobaltous fluoride	0[4]	(2)/(1)	(2)	0	0	C/D	P	SK		S	VI
Cobaltous formate	0[4]	(2)/(1)	(2)	0	0	C/D	P	SK		S	VI
Cobaltous iodide	0[4]	(2)/(0)	2	0	0	C/D	P	SK		S	VI
Cobaltous nitrate	0[4]	(2)/(1)	2	0	0	C/D	P	SK		S	VI
Cobaltous perchlorate	0[4]	(2)/(0)	(2)	0	0	C/D	P	SK		S	VI
Cobaltous succinate	0[4]	(2)/(1)	(2)	0	0	C/D	P	SK		S	VI
Cobaltous sulfamate	0[4]	(2)/(1)	(2)	0	0	C/D	P	SK		S	VI
Cobaltous sulfate	0[4]	(2)/(1)	(2)	0	0	C/D	P	SK		S	VI
Coumaphos [9]	0	4	3	I	XXX	A	P	SK		I/S	VII/VI
Cresol	T	2[1]/(2)[1]	1[1]	I	XX	B[3]	NP	M			XII
Cupric acetate	0[4]	2/(2)	1	0	0	C/B	P	SK		S	VI
Cupric acetoarsenite	T	(3)[1]	(3)	0	XX	A	P	SK		I	VII
Cupric acetylaceton te	0[4]	(3)	(3)	0	0	B	P	SK		S	VI
Cupric bromide	0[4]	(3)	(1)	0	0	B	P	SK		S	VI
Cupric chloride	0[4]	(3)	(1)	0	0	B	P	SK		S	VI
Cupric formate	0[4]	(3)	(1)	0	0	B	P	SK		S	VI
Cupric gluconate	0[4]	(3)/(2)	(1)	0	0	B/C	P	SK		S	VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Cupric glycinate	0[4]	(3)	(1)	0	0	B	P	SK		S	VI
Cupric lactate	0[4]	(3)	(1)	0	0	B	P	SK		S	VI
Cupric nitrate	0[4]	(3)	1	0	0	B	P	SK		S	VI
Cupric oxalate	0[4]	(3)	(1)	0	0	B	P	SK		I	VII
Cupric subacetate	0[4]	(3)	1	0	0	B	P	SK		S	VI
Cupric sulfate	0[4]	(3)	2	0	0	B	P	SK		S	VI
Cupric sulfate ammoniated	0[4]	(3)	(3)	0	XX	B	P	SK		S	VI
Cupric tartrate	0[4]	(3)	(1)	0	0	B	P	SK		I	VII
Cuprous bromide	0[4]	(3)	(1)	0	0	B	P	SK		I	VII
Cuprous iodide	0[4]	(3)	(1)	0	0	B	P	SK		I	VII
Cyanogen chloride	0	4	(2)[1]	II	XX	A	P	M			V
Cyclohexane	0	2 / (2)	0	0	X[1]	C[2]	NP	F	V	I	IX
2,4-D (acid)[g]	0[4]	1[1] / 3	(2)	0	XX[1]	D/B	NP	SK		I/S	XIV / XIII
2,4-D (esters)[g]	0[4]	3	(2)	0	XX[1]	B	NP	SK		I/S	XIV / XIII
Dalapon	0	1 / 3	(1)	0	0	D/B	P	SK		S	VI
DDT[g]	±	4	2	0	XXX	A	P	SK		I/S	VII / VI
Diazinon[g]	0[4]	4 / (4)	2	0	XX	A	NP	SK		I/S	XIV / XIII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Dicamba	0	2	1	0	0	C	P	SK		S	VI
Dichlobenil[g]	0	2 / 3	(1)	0	0	C/B	P	SK		I/S	VII / VI
Dichlone[g]	0	4	1	I	XXX	A	P	SK		I/S	VII / VI
Dichlorvos	0	4	2	I	XXX	A	P	SK		S	VI
Dieldrin[g]	±	4	3	I	XXX	A	P	SK		I/S	VII / VI
Diethylamine	0	(2)	1[1]	I	X	C[2]	NP	F	V	S	VIII
Dimethylamine	0	(2)	1	I	X[1]	C[2]	P	F	V	S	VIII
Dinitrophenol	?	(2)[1]	3	I	XXX	B	NP	SK		S	XIII
Diquat	0	2 / 3	2	0	XX	C/B	P	SK		S	VI
Disulfoton[g]	0	4 / (4)	3	I	XXX	A	P	SK		I/S	VII / VI
Diuron[g]	0	3	2[1]	0	XX	B	P	SK		I/S	VII / VI
Dodecylbenzenesulfonic acid	0	(2) / (3)	2	0	X	C/B	NP	SK		S	XIII
Dursban[g]	0	4	2	I	XXX	A	P	SK		I/S	VII / VI
Endosulfan[g]	0[1]	4	2	I	XXX	A	P	SK		I/S	VII / VI
Endrin[g]	±	4	3	?	XXX	A	P	SK		I/S	VII / VI
Ethion[g]	0	4 / (4)	3	I	XXX	A	P	SK		I/S	VII / VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Biocumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	INCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Ethylbenzene	0	2/(2)	1[1]	0	X	C[2]	P	F	V	I	II
Ethylenediamine	0	2	1	I	X	C[2]	NP	M			XII
EDTA	0	(1)	2	0	0	D	P	SK		I	VII
Ferric ammonium citrate	0	(2)/(2)	(1)	0	X	C	P	SK		S	VI
Ferric chloride	0	(2)/2	1	0	X	C	P	SK		S	VI
Ferric fluoride	0	(2)/(2)	(1)	0	X	C	P	SK		S	VI
Ferric nitrate	0	(2)/(2)	(1)	0	X	C	P	SK		S	VI
Ferric phosphate	0	(2)/(2)	(1)	0	X	C	P	SK		I	VII
Ferric sulfate	0	(2)/(2)	(1)	0	X	C	P	SK		S	VI
Ferrous ammonium sulfate	0	(2)/(2)	(1)	0	X	C	P	SK		S	VI
Ferrous chloride	0	(2)/(2)	(1)	0	X	C	P	SK		S	VI
Ferrous oxalate	0	(2)/(2)	(1)	0	X	C	P	SK		I	VII
Ferrous sulfate	0	2/(2)	1	0	X	C	P	SK		S	VI
Formaldehyde	0	2/(1)[1]	1[1]	I	X[1]	C[2]/D[3]	NP	F	V	S	I
Formic acid	0	1/(2)[1]	1	I	0	D[2]/C[3]	NP	M			XII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Fumaric acid	0	1/(1)	(2)	0	X	D	NP	SK		S	XIII
Furfural	0	2/(2)	2	0	X	C	NP	M			XII
Guthion[g]	0	4	3	I	XXX	A	P	SK		I/S	VII/VI
Heptachlor[g]	±	4	2	I[1]	XXX	A	P	SK		I/S	VII/VI
Hydrochloric acid	0	2[1]/(1)	(1)	0	0	C[3]/D[2]	NP	SK		S	XIII
Hydrofluoric acid	0	(3)[1]/1	2	0[1]	0	B[3]/D[3]	NP	M		S	XII
Hydrogen cyanide	0	4	4[1]	II	0	A	NP	M			XII
Hydroquinone	0	3/(3)	2	0	0	B	NP	SK		S	XIII
Hydroxylamine	0	(1)	(1)	0	0	D	NP	M			XII
Isoprene	0	2[1]/(2)[1]	(0)	0	X[1]	C[3]	NP	F	V	I	IX
Isopropanolamine dodecylbenzene-sulfonate	0	(2)	(1)	0	X	C	NP	SK		S	XIII
Kelthane[g]	0	1/(1)	1	I	XXX	C	P	SK		I/S	VII/VI
Lead acetate	±	(1)	1	0	0	A	P	SK		I[5]	VII/VI
Lead bromide	±	(1)	(1)	(1)	0	A	P	SK		I[5]	VII
Lead chloride	±	1	1	0	0	A	P	SK		I[5]	VII
Lead fluoborate	±	(1)	2	0	0	A	P	SK		I[5]	VII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Ammonia	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[a,f]
Lead fluoride	±	(1)	1	0	0	A	P	SK		I	VII
Lead iodide	±	(1)	(1)	0	0	A	P	SK		I	VII
Lead nitrate	±	(1)	1	0	0	A	P	SS		I[3]	VII
Lead stearate	±	(1)	(1)	0	0	A	P	SK		I[3]	VII
Lead sulfate	±	(1)	(1)	0	0	A	P	SK		I	VII
Lead sulfide	±	(1)	(1)	0	0	A	P	SK		I	VII
Lead tetraacetate	±	(1)	(1)	0	0	A	P	SK		I[3]	VII
Lead thiocyanate	±	(1)	(2)	0	0	A	P	SK		I	VII
Lead thiosulfate	0	(1)	(1)	0	0	A	P	SK		I	VII
Lead tungstate	±	(1)	(1)	0	0	A	P	SK		I	VII
Lindane	±	0	2	0	SK	A	P	SK		I/S	VII / VI
Lithium bichromate	0[6]	(1)	(2)	0	0	D	P	SK		S	VI
Lithium chromate	0[6]	(2)	(2)	0	0	D	P	SK		S	VI
Lithium fluoride	0	(2) / (1)	2	0	0	D/S	P	SK		S	VI
Malathion[c]	0	0	1	0	SK	A	P	AA		I/S	VII / VI
Maleic acid	0	1 / (2)	1	0	0	D	MP	SK		S	XIII
Maleic anhydride	0	(2)	1	0	0	D	MP	P	AK	S	A

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]					IMCO[d] CATEGORY	PHYSICAL/CHEMICAL PROFILE[b]				PHYSICAL/CHEMICAL GROUP[e,f]
	Dissolution	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities		Persistence	Behavior	Volatility	Solubility[g]	
Mercuric acetate	+	(0)	(3)	0	0	A	P	SR		I[5]	VII
Mercuric chloride	+	(0)	4[1]	0	0	A	P	SR		I[5]	VII
Mercuric nitrate	+	(0)	(3)	0	0	A	P	SR		I[5]	VII
Mercuric oxide	+	(0)	(2)	0	0	A	P	SR		I	VII
Mercuric sulfate	+	(0)	(2)[1]	0	0[1]	A	P	SR		I	VII
Mercuric thiocyanate	+	(0)	(3)	0	0	A	P	SR		I	VII
Mercurous nitrate	+	(0)	(3)	0	0	A	P	SR		I	VII
Methoxychlor[9]	0	4	1	1	XXX	A	P	SR		I/S	VII
Methyl mercaptan	0	1 (3)	(3)	1	XX	B	P	P	V	S	I VI
Methyl methacrylate	0	1 (2)	0[1]	0	X	D[3]	NP	P	V	I	IX
Methyl parathion[9]	0	3 (4)	3	1	XX	A/A	NP	SR		I/S	XIV XIII
Naphthalene	0	4	(1)	1	XX	A	NP	SR		S	XIII
Nickelous bromide	0	1 (3)[1]	2	0	X	D	P	SR		S	VI
Nonylphenol	0	2 (2)	1	1	X	D	NP	P	V	S	VIII
Nonylphenolate	0	2 (2)	1	1	X	D	NP	P	V	S	VIII
Phenol	0	4 (4)	2	1	XX	A	NP	SR		I	XIV

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[e]	PHYSICAL/CHEMICAL GROUP[b,f]
Naphthalene	0	1	1	0	X	A[2]	P	SS		1	VII
Naphthenic acid	(0)	1/(1)	(1)	0	X	A[2]	P	SS		S	VI
Nickel acetate	0	(1)	(1)	0	0	D	P	SS		S	VI
Nickel ammonium sulfate	0	(1)	(2)	0	0	D	P	SS		S	VI
Nickel bromide	0	(1)	(3)	0	0	D	P	SS		S	VI
Nickel chloride	0	(1)	3	0	0	D	P	SS		S	VI
Nickel formate	0	(2)/(1)	(2)	0	0	C/D	P	SS		S	VI
Nickel hydroxide	0	(2)/(1)	(2)	0	0	C/D	P	SS		I	VII
Nickel nitrate	0	(1)/(1)	(1)	0	0	D	P	SS		S	VI
Nickel sulfate	0	(1)	3	0	0	D	P	SS		S	VI
Nitric acid	0	2/1	(2)[1]	1[1]	A[1]	C[2]/D[3]	SP	GE		S	XIII
Nitrobenzene	0	(1)	1	0	X	D	P	SS		S	VI
Nitrogen dioxide	0	(2)/(1)	(2)	1	X	C/D	SP	GS		S	XIII
Nitrophenol	1	2/(2)	2	1	SS	D	P	SS		S	VI
Paraformaldehyde	0	(2)/(1)	1	1	X	C/D	SP	SS		S	XIII
Parathion[7]	0	5	3[1]	11	XXX	A	P	SS		I/S	VII/VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Accumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[c]	PHYSICAL/CHEMICAL GROUP[e,f]
Pentachlorophenol	?	3/3	1	1	XX	A	P	SR		I	VII
Phenol	?	2	1[1]	1	XX	B[2]	NP	N			XII
Phosgene	0	(2)/(1)	-	0	0	C/D	NP	SR		S	XIII
Phosphoric acid	0	1/(1)	0	1	0	D[2]	NP	SR		S	XIII
Phosphorus	0[1]	4	3[1]	1[1]	XX[1]	A[2]	NP	SR		I	XIV
Phosphorus oxychloride	0	(2)/(1)	(2)	1	XX	C/D	NP	SR		S	XIII
Phosphorus pentafluoride	0	(3)/(1)	(2)	1	XX	B/D	NP	SR		S	XIII
Phosphorus pentasulfide	0	(2)	(2)	1	XX	C	NP	SR		S	XIII
Phosphorus trichloride	0	(2)/(1)	(2)	1	XX	C/D	NP	SR		S	XIII
Polychlorinated biphenyls	±	4/3	1	0	XX	A[2]	P	SR		I	VII
Potassium arsenate	±	(2)/(2)	(1)	0	0	A	P	SR		S	VI
Potassium arsenite	±	(2)	1	0	0	A	P	SR		S	VI
Potassium bichromate	0	1	2	0	0	D	P	SR		S	VI
Potassium chromate	0	1	2	0	0	D	P	SR		S	VI
Potassium cyanide	0	4	3	1	0	A	NP	SR		S	XIII
Potassium hydroxide	0	2/(2)	1	0	0	C[2]	NP	SR		S	XIII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Potassium permanganate	0	3 / (3)	1	0	XX	B	P	SK		S	VI
Propionic acid	0	1 / (1)	1	0	0[1]	D[2]	NP	M			XII
Propionic anhydride	0	(1)	1	0	0	D[2]	NP	M			XII
Propyl alcohol	0	1 / 0[1]	1	0	0	D[2]/0	NP	F	V	S	VIII
Pyrethrine ?	0	1 / (2)	1	0	X	C	P	SK		I/S	VII / VI
Pyrogallic acid	±	2 / (2)	3	0	0	B	P	SK		S	VI
Quinoline	±	(3)	2	0	0	A	NP	M			XII
Resorcinol	±	2 / (2)	1	0	X	B	NP	SK		S	XIII
Selenic acid	±	(2)	(3)	0	0	A	P	SK		I	VII
Selenium oxide	±	2 / (2)	(3)	0	0	A	P	SK		I	VII
Sevin *	0	3[1]	1	0	X	B	P	SK		I/S	VII / VI
Sodium	0	(2)	(1)	0	0	C	NP	M			XII
Sodium arsenate	±	2[1] / (2)[1]	2	0	0	A	P	SK		S	VI
Sodium arsenite	±	2 / (2)	3[1]	0	0	A	P	SK		S	VI
Sodium bichromate	0	1[1] / (1)[1]	2[1]	0	0	D[3]	P	SK		S	VI
Sodium bifluoride	0	(3) / (1)	(2)	0	0	B/D	P	SK		S	VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]					IMCO[d] CATEGORY	PHYSICAL/CHEMICAL PROFILE[b]				PHYSICAL/CHEMICAL GROUP[e,f]
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities		Persistence	Behavior	Volatility	Solubility[g]	
Sodium bisulfite	0	1/(1)	2	0	0	D	NP	SK		S	XIII
Sodium chromate	0	1/(1)	(2)	0	0	D	P	SK		S	VI
Sodium cyanide	0	4	3	0	0	A	NP	SK		S	XIII
Sodium dodecylbenzenesulfonate	0	(2)	1	0	X	C	NP	SK		S	XIII
Sodium fluoride	0	3/1	2	0	0	B/D	P	SK		S	VI
Sodium hydrosulfide	0	(2)	(2)	0	0	C	NP	SK		S	XIII
Sodium hydroxide	0	2/(2)	1	1	0	C[2]	NP	SK		S	XIII
Sodium hypochlorite	0	(4)/(3)	(3)	0	X	A/B	NP	M			XII
Sodium methylate	0	(1)/(2)	(1)	0	0	D/C	NP	M			XII
Sodium nitrite	0	1	2	0	0	B	NP	SK		S	XIII
Sodium phosphate (mono-basic)	0	1/(1)	(1)	0	0	D	P	SK		S	XIII
Sodium phosphate (di-basic)	0	1/(1)	(1)	0	0	D	P	SK		S	XIII
Sodium phosphate (tri-basic)	0	1/(1)	(1)	0	0	D	P	SK		S	XIII
Sodium selenite	+	(2)	3	0	0	A	P	SK		I	VII
Sodium sulfide	0	2/(2)	(7)	0	0	C	NP	SK		S	XIII
Strontium chromate	0	(1)	(2)	0	0	D	P	SK		I	VII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]					PHYSICAL/CHEMICAL PROFILE[b]					
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Strychnine	0	(1)	3	0	0	B	P	SK		I	VII
Styrene	0	2	1	0	XX	C[2]	NP	F	V	I	IX
Sulfuric acid	0	(2)	1	I	0	C[2]	NP	SK		S	XIII
Sulfur monochloride	0	(2) / (3)	(1)	0	0	C/B	NP	M			XII
2,4,5-T (acid)[g]	0	(3) / 4[1]	2[1]	0	XX	B/A	NP	SK		I/S	XIV / XIII
2,4,5-T (esters)[g]	0	(2)[1]	2[1]	0	XX	C	NP	SK		I/S	XIV / XIII
Tannic acid	0	2 / (2)	0	0	0	C	P	M			V
TDE[g]	±	4 / (4)	1	I	XXX	A	P	SK		I/S	VII / VI
Tetraethyl lead	3[1]	4[1] / (4)[1]	(3)	II	XXX	A[2]	P	SK		I	VII
Tetraethyl pyrophosphate	0	4 / (4)	4	I	XX	A	NP	M			XII
Toluene	0	2	0	0	X	C[2]	NP	F	V	I	IX
Toxaphene[g]	2	4	2	I	XXX	A	P	SK		I/S	VII / VI
Trichlorfon	0	± / (1)	2	0	0	D	P	SK		S	VI
Trichlorophenol	?	4 / (4)	1	I	XX	A	NP	SK		I	XIV
Triethanolamine dodecylbenzene-sulfonate	?	(2)	(2)	0	X	C	NP	SK		S	XIII
Triethylamine	0	± / (2)	2[1]	I	X	C[2]	NP	F	V	S	VIII

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	DMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[e]	PHYSICAL/CHEMICAL GROUP[a,f]
Trimethylamine	0	(2)	2	I	K	C	WP	F	V	S	VIII
Uranium peroxide	0	(1)	(2)	0	0	D	P	SK		I	VII
Uranyl acetate	0	(1)	(2)	0	0	D	P	SK		S	VI
Uranyl nitrate	0	(1)	(2)	0	0	D	P	SK		S	VI
Uranyl sulfate	0	(1)	(2)	0	0	D	P	SK		S	VI
Vanadium oxytrichloride	0	(1)	2	0	0	D	P	SK		I	VII
Vanadium pentoxide	0	2/(2)	(2)	0	0	C	P	SK		S	VI
Vanadyl sulfate	0	2*/(2)	4	0	0	C	P	SK		S	VI
Vinyl acetate	0	2/(2)	1	0	A	C[2]	WP	M			XII
Xylene	0	2/(2)	1	0	K	C[2]	P	F	V	I	II
Xylenol	0	(2)	2	0	K	C	WP	SK		S	XIII
Zectran*	0	2/(2)	1	0	0	C	P	SK		I/S	VII/VI
Zinc acetate	0[6]	(2)	1	0	0	C	P	SK		S	VI
Zinc ammonium chloride	0[6]	(2)	(2)	0	0	C	P	SK		S	VI
Zinc bichromate	0[6]	(2)	(2)	0	0	C	P	SK		I	VII
Zinc borate	0[6]	(2)	(2)	0	0	C	P	SK		S	VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[h]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[d]	PHYSICAL/CHEMICAL GROUP[e,f]
Zinc bromide	0[4]	(2)	(2)	0	0	C	P	SK		S	VI
Zinc carbonate	0[4]	(2)	(2)	0	0	C	P	SK		I	VII
Zinc chloride	0[4]	(2)	2	0	0	C	P	SK		S	VI
Zinc cyanide	0[4]	(4)	(2)	0	0	A	NP[g]	SK		S	XIII
Zinc fluoride	0[4]	(2)	(2)	0	0	C	P	SK		S	VI
Zinc formate	0[4]	(2)	(2)	0	0	C	P	SK		S	VI
Zinc hydrosulfite	0[4]	(2)	(2)	0	0	C	P	SK		S	VI
Zinc nitrate	0[4]	(2)	1	0	0	C	P	SK		S	VI
Zinc permanganate	0[4]	(2)	(2)	0	0	C	P	SK		S	VI
Zinc phenolsulfonate	0[4]	(1) / (2)	(2)	1	XX	D/C	P	SK		S	VI
Zinc phosphide	0[4]	(2)	3	0	0	C	P	SK		I	VII
Zinc potassium chromate	0[4]	(2)	(2)	0	0	C	P	SK		I	VII
Zinc propionate	0[4]	(2)	(2)	0	0	C	P	SK		S	VI
Zinc silicofluoride	0[4]	(2)	2	0	0	C	P	SK		S	VI
Zinc sulfate	0[4]	1 / (2)	(2)	0	0	C	P	SK		S	VI

Hazardous Material	HAZARD POTENTIAL PROFILE[a,c]						PHYSICAL/CHEMICAL PROFILE[b]				
	Bioaccumulation	Damage[b] to Living Resources	Human Health (oral)	Human Health (external)	Reduction of Amenities	IMCO[d] CATEGORY	Persistence	Behavior	Volatility	Solubility[f]	PHYSICAL/CHEMICAL GROUP[e,f]
Zirconium acetate	0	(1)	(1)	0	0	D	P	SK		S	VI
Zirconium nitrate	0	(1)	1	0	0	D	P	SK		S	VI
Zirconium oxychloride	0	1 / (1)	1	0	0	D	P	SK		S	VI
Zirconium potassium fluoride	0	(1) / (1)	(1)	0	0	B/D	P	SK		S	VI
Zirconium sulfate	0	1 / (1)	1	0	0	D	P	SK		S	VI
Zirconium tetrachloride	0	(1)	1	0	0	D	P	SK		S	VI

APPENDIX H

HAZARDOUS MATERIALS
BY IMCO HAZARD CATEGORY

This appendix lists hazardous materials by hazard category. Certain materials can be placed in two different categories if there are substantial differences in their freshwater and saltwater aquatic toxicities.

CATEGORY A

Acrolein
Aldrin
Allyl alcohol (FW)
Acetic acid
Arsenic disulfide
Arsenic pentoxide
Arsenic tribromide
Arsenic trichloride
Arsenic trifluoride
Arsenic triiodide
Arsenic trioxide
Arsenic trisulfide
Brucine (SW)
Cadmium acetate
Cadmium bromide
Cadmium chloride
Cadmium nitrate
Cadmium sulfate
Calcium arsenate
Calcium arsenite
Calcium cyanide
Calcium hypochlorite (FW)
Captan
Chlordane
Chlorine
Coumaphos
Cupric acetoarsenite
Cyanogen chloride
DDT
Diazinon
Dichlone
Dichlorvos
Dieldrin
Disulfoton
Dursban
Endosulfan
Endrin
Ethion
Guthion
Heptachlor
Hydrogen cyanide
Lead acetate
Lead bromide
Lead chloride
Lead fluoborate
Lead iodide
Lead nitrate
Lead stearate
Lead sulfate
Lead sulfide
Lead tetraacetate
Lead thiosulfate
Lead tungstate
Lindane
Malathion
Mercuric acetate
Mercuric chloride
Mercuric nitrate
Mercuric oxide
Mercuric sulfate
Mercuric thiocyanate
Mercurous nitrate
Methoxychlor
Methyl parathion (SW)
Mevinphos
Naled
Naphthalene
Naphthenic acid
Parathion
Pentachlorophenol
Phosphorus
Polychlorinate biphenyls
Potassium arsenate
Potassium arsenite
Potassium cyanide
Quinoline

Selenic acid
Selenium oxide
Sodium arsenate
Sodium arsenite
Sodium cyanide
Sodium hypochlorite (FW)
Sodium selenite
2,4,5-T acid (SW)
TDE
Tetraethyl pyrophosphate
Toxaphene
Trichlorophenol
Zinc cyanide

CATEGORY B

Allyl alcohol (SW)
Allyl chloride (SW)
Aluminium fluoride (FW)
Ammonium carbonate
Ammonium chloride
Ammonium hypophosphite
Ammonium nitrate
Ammonium sulfate
Antimony pentafluoride (FW)
Beryllium fluoride (FW)
Beryllium hydroxide
Brucine (FW)
Butyric acid
Calcium hypochlorite (SW)
Chlorobenzene
Chloroform
Chromic acetate (FW)
Chromic sulfate
Chromous carbonate (FW)
Chromous chloride
Chromous oxalate (FW)
Cresol
Cupric acetate (SW)
Cupric acetylacetonate
Cupric bromide
Cupric chloride
Cupric formate
Cupric gluconate (FW)
Cupric lactate
Cupric nitrate
Cupric oxalate
Cupric subacetate
Cupric sulfate
Cupric sulfate ammoniated
Cupric tartrate
Cuprous bromide
Cuprous iodide
2,4-Dichlorophenoxyacetic acid (SW)
2,4-Dichlorophenoxyacetic esters
Dalapon (SW)
Dichlobenil (SW)
Dinitrophenol
Diquat (SW)
Diuron
Dodecylbenzenesulfonic acid (SW)
Hydrofluoric acid (FW)
Hydroquinone
Lithium fluoride (FW)
Methyl mercaptan
Methyl parathion (FW)
Monoethylamine
Monomethylamine
Phenol
Phosphorus pentafluoride (FW)
Potassium permanganate
Pyrogallic acid
Resorcinol
Sevin
Sodium bifluoride (FW)
Sodium fluoride (FW)
Sodium hypochlorite (SW)
Sodium nitrite
Strychnine
Sulfur monochloride (SW)
2,4,5-T acid (FW)
Zirconium potassium fluoride (FW)

CATEGORY C

Acetaldehyde
Acetic acid
Acetic anhydride
Acetone cyanohydrin
Acrylonitrite
Allyl chloride (FW)
Ammonium bicarbonate
Ammonium bromide
Ammonium carbonate
Ammonium fluoborate
Ammonium hydroxide
Ammonium iodide
Ammonium molybdate
Ammonium pentaborate
Ammonium persulfate
Ammonium silicofluoride
Amyl acetate
Aniline
Atimony pentachloride
Anti ony pentafluoride (SW)
Antimony potassium tartrate
Antimony tribromide
Antimony trichloride
Antimony trifluoride
Antimony triiodide
Benzene
Benzonitrite
Beryllium fluoride (SW)
Beryllium hydroxide
Beryllium nitrate
Butyl acetate
Butyl amine
Calcium dodecylbenzene-
sulfonate
Carbon disulfide
Catechol
Chlorosulfonic acid (FW)
Chromic acetate (SW)
Chromic acid
Chromic sulfate (SW)
Chromious carbonate (SW)
Chromous oxalate (SW)
Chromyl chloride (FW)
Cobaltous acetate (FW)
Cobaltous bromide (FW)
Cobaltous chloride (FW)
Cobaltous citrate (FW)
Cobaltous fluoride (FW)
Cobaltous formate (FW)
Cobaltous iodide (FW)
Colbaltous nitrate (FW)
Cobaltous perchlorate (FW)
Cobaltous succinate (FW)
Cobaltous sulfamate (FW)
Cobaltous sulfate (FW)
Cupric acetate (FW)
Cupric gluconate (SW)
Cyclohexane
Dicamba
Dichlobenil (FW)
Diethylamine
Diquat (FW)
Dodecylbenzenesulfonic
acid (FW)
Ethylenediamine
Ferric ammonium citrate
Ferric chloride
Ferric fluoride
Ferric nitrate
Ferric phosphate
Ferric sulfate
Ferrous ammonium sulfate
Ferrous chloride
Ferrous oxalate
Ferrous sulfate
Formaldehyde (FW)
Formic acid (SW)
Furfural
Hydrochloric acid (FW)
Isoprene
Isopropanolamine dodecy-
lbenzenesulfonate
Kelthane
Nickel formate (FW)
Nickel hydroxide (FW)
Nitric acid (FW)
Nitrogen dioxide (FW)
Paraformaldehyde (FW)
Phosgene (FW)
Phosphorus oxychloride (FW)
Phosphorus pentasulfide
Phosphorus trichloride (FW)
Potassium hydroxide
Pyrethins

Sodium
Sodium dodecylbenezenesulfonate
Sodium hydrosulfite
Sodium hydroxide
Sodium methylate (SW)
Sodium sulfide
Sodium fluoride (FW)
Styrene
Sulfuric acid
Sulfur monochloride (FW)
2,4,5-T ester
Tannic acid
Triethanolamine dodecylbenzene-
sulfonate
Triethylamine
Trimethylamine
Vanadium pentoxide
Vanadyl sulfate
Vinyl acetate
Xylene
Xylenol
Zectran
Zinc acetate
Zinc ammonium chloride
Zinc bichromate
Zinc borate
Zinc bromide
Zinc carbonate
Zinc chloride
Zinc formate
Zinc hydrosulfite
Zinc nitrate
Zinc permanganate
Zinc phenolsulfonate (SW)
Zinc phosphide
Zinc potassium chromate
Zinc propionate
Zinc silicofluoride
Zinc sulfate

CATEGORY D

Acetyl bromide
Acetyl chloride
Adiponitrile
Aluminum fluoride (SW)
Aluminum sulfate
Ammonium acetate
Ammonium benzoate
Ammonium chromate
Ammonium citrate
Ammonium fluoride
Ammonium formate
Ammonium oxalate
Ammonium sulfamate
Ammonium sulfide
Ammonium tartrate
Ammonium Thiocyanate
Ammonium thiosulfate
Antimony trioxide
Benzoic acid
Benzoyl chloride
Benzyl chloride
Beryllium chloride
Beryllium nitrate
Beryllium sulfate
Calcium chromate
Calcium hydroxide
Calcium oxide
Chlorosulfonic acid (SW)
Chromyl chloride (SW)
Cobaltous acetate (SW)
Cobaltous bromide (SW)
Cobaltous chloride (SW)
Cobaltous citrate (SW)
Cobaltous fluoride (SW)
Cobaltous formate (SW)
Cobaltous nitrate (SW)
Cobaltous succinate (SW)
Cobaltous sulfamate (SW)
Cobaltous sulfate (SW)
2,4-Dichlorophenoxyacetic
acid (FW)
Dalapon
EDTA
Formaldehyde (SW)
Formic acid (FW)
Fumaric acid
Hydrochloric acid (SW)
Hydrofluoric acid (SW)
Hydroxylamine
Lithium bichromate
Lithium chromate
Lithium fluoride (SW)

Maleic acid
Maleic anhydride
Methyl methacrylate
Molybdic trioxide
Nickel acetate
Nickel ammonium sulfate
Nickel bromide
Nickel formate (SW)
Nickel hydroxide (SW)
Nickel sulfate
Nitric acid (SW)
Nitrobenzene
Nitrogen dioxide (SW)
Paraformaldehyde (SW)
Phosgene
Phosphoric acid
Phosphorus oxychloride (SW)
Phosphorus pentafluoride (SW)
Phosphorus trichloride (SW)
Potassium bichromate
Potassium chromate
Propionic acid
Propionic anhydride
Propyl alcohol (FW)

Sodium bichromate
Sodium bifluoride (SW)
Sodium bisulfite
Sodium bisulfite
Sodium chromate
Sodium fluoride (SW)
Sodium methylate (FW)
Sodium phosphate (monobasic)
Sodium phosphate (dibasic)
Sodium phosphate (tribasic)
Strontium chromate
Trichlorfon
Uranium beroxide
Uranyl acetate
Uranyl nitrate
Uranyl sulfate
Vanadium oxytrichloride
Zinc phenolsulfonate (FW)
Zirconium acetate
Zirconium nitrate
Zirconium oxychloride
Zirconium potassium fluoride (SW)
Zirconium sulfate
Zirconium tetrachloride

CATEGORY D

Cobaltous iodide (SW)
Cobaltous perchlorate (SW)
Propyl alcohol (SW)

APPENDIX I

DETERMINATION OF IMCO METHODOLOGY ADJUSTMENT FACTORS FOR DEGRADABILITY AND DISPERSIBILITY THROUGH THE USE OF A DELPHI TECHNIQUE

GENERAL

Adjustment factors to compensate for degradability and dispersibility in the IMCO Methodology were derived through the use of the DELPHI technique.

The DELPHI method is a procedure involving the repeated questioning of persons knowledgeable in the area of interest in an attempt to obtain a coalescence of "expert opinion" on an otherwise intractable question. It is an iterative process which attempts to control the interaction between participants so as to minimize direct confrontation and the personality conflicts and biases which can arise as a result of such confrontations. Interaction between the participants is realized through the investigator(s) who attempts to remain impartial. Information and opinions are transferred between participants through questionnaires and interviews conducted by the investigator(s). Hopefully this process, when repeated enough times, results in a clarification of the basic questions at issue and a convergence of opinion by the participants.

Thus, the approach taken under the IMCO Methodology is a subjective one which attempts to quantify the rather elusive effects which the physical/chemical properties of the hazardous materials have on their ability to exert various hazard potentials.

PROCEDURE

From the staff of Battelle's Pacific Northwest Laboratories, a panel of ten individuals was selected to participate in the DELPHI. This panel was composed of three environmental engineers, one chemical engineer specializing in hazardous materials, one chemical engineer specializing in oil pollution abatement, two aquatic chemists, a hydrodynamicist, a mineralogist, and an aquatic biologist. These individuals were selected in such a manner so as to obtain a fairly broad representation of disciplines qualified to relate to the problem. This was felt to be especially important because there is no single discipline completely qualified to address the question. Although such a broad spectrum of backgrounds could potentially lead to wide variations in the results, it was felt that evaluation of the question from as many points of view as possible was a more important consideration. Having selected the participants, a questionnaire was prepared and

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distributed. The questionnaire briefly described the project for which the DELPHI was being conducted and then posed the following question.

> "The particular problem to be studied is that of determining a series of adjustment factors which will be applied to the basic rate of penalty derived from the "worst case" approach described previously. Specifically, we wish to know the extent to which the physical/chemical properties of a hazardous material can act to reduce its impact in a number of hazard potential areas. The hazard potential areas we have identified are listed and described in Enclosure I. The important physical/chemical properties which we are considering are listed and described in Enclosure II. Furthermore, we wish to consider impacts in four basic water body types: rivers, lakes, estuaries, and coastal zones. Since we are developing a very general methodology, we have chosen not to define the water bodies. Instead, the participants are to use their own individual conceptions of each of the four water bodies."*

Following the statement of the basic question, the participants were given detailed instruction as to how they were to complete the questionnaire. They were instructed to assign an adjustment factor between zero and one based on their assessment of the ability of a given set of physical/chemical characteristics attributed to a hypothetical hazardous material to mitigate a given hazard potential (e.g., bioaccumulation) in a given water body type. A value of one indicated that there was no mitigation, whereas a value of zero meant the physical/chemical properties were such that they would completely inhibit the ability of the hazardous material to exert the specified hazard in the specified water body type. Figure I-1 is a sample of one of the questionnaire sheets. Referring to Figure I-1, the participant, on this particular sheet, would be evaluating the ability of hazardous materials with the various sets of physical/chemical properties described by the "line diagram" to bioaccumulate in a lake.

Following completion of the first round, selected participants were interviewed by the investigators. The comments from these interviews were reported in a second questionnaire along with the numerical results of the first round. A number of issues were clarified during the interviews, but by far the most important disclosure was that many of the participants were making unnecessary value judgments with respect to the hazard potentials themselves. This point was clarified in the second round by expanding and restating the question as follows:

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*Enclosures I and II from the questionnaire are included in this appendix as Enclosures I-1 and I-2.

WATER BODY TYPE Lake

HAZARD POTENTIAL Bioaccumulation

FIGURE I-1. EXAMPLE QUESTIONNAIRE SHEET

"The particular problem to be studied is that of determining a series of adjustment factors which will be applied to the basic rate of penalty derived from the "worst case" approach described previously. Specifically, we wish to know the extent to which the physical/chemical properties of a hazardous material can act to reduce its impact in a number of hazard potential areas. The hazard potential areas we have identified are listed and described in Enclosure I. The important physical/chemical properties which we are considering are listed and described in Enclosure II. Furthermore, we wish to consider impacts in four basic water body types: rivers, lakes, estuaries, and coastal zones. Since we are developing a very general methodology, we have chosen not to define the water body. Instead, the participants are to use their own individual conceptions of each of the four water bodies.

"Participants are again cautioned not to make value judgments concerning either the relative importance of the five hazard potentials or their opinion of the relative significance of the hazard potentials in the various water body types. In all cases, assume that the hazard potential exists and base your evaluation only on your estimation of the degree to which the physical/chemical properties are mitigating."

The results of the second round of questioning are reported in the following table as the median adjustment factor value and the range of reported adjustment factor values. During the second round of questioning, coalescence of opinion improved markedly. For purposes of computing final rates of penalty, the median adjustment factor values are used.

TABLE I-1
IMCO METHODOLOGY PHYSICAL/CHEMICAL ADJUSTMENT FACTORS

PHYSICAL/CHEMICAL PROPERTIES	LAKE				
	BA	AT	HHO	HHE	AM
I. Persistent, Floats, Volatile, Soluble	.4 (.3-.8)	.5 (.3-.8)	.45 (.3-.8)	.7 (.4-.9)	.6 (.1-.8)
II. Persistent, Floats, Volatile, Insoluble	.2 (.1-.8)	.3 (.1-.7)	.25 (.1-.6)	.65 (.5-.9)	.6 (.1-1.0)
III. Persistent, Floats, Nonvolatile, Soluble	.8 (.4-1.0)	.8 (.4-1.0)	.8 (.5-1.0)	.85 (.7-1.0)	.7 (.3-.9)
IV. Persistent, Floats, Nonvolatile, Insoluble	.4 (.2-.8)	.5 (.2-.8)	.35 (.2-.6)	.9 (.5-1.0)	.85 (.6-1.0)
V. Persistent, Mixer	1.0 (.5-1.0)	1.0 (.6-1.0)	.85 (.5-1.0)	.75 (.3-1.0)	.65 (.3-1.0)
VI. Persistent, Sinks, Soluble	.9 (.4-1.0)	.85 (.4-1.0)	.75 (.3-.9)	.5 (.2-.8)	.4 (.2-.7)
VII. Persistent, Sinks, Insoluble	.6 (.2-1.0)	.5 (.2-.9)	.35 (.1-.8)	.2 (.1-.5)	.2 (0-.4)
VIII. Nonpersistent, Floats, Volatile, Soluble	X	.3 (.1-.6)	.25 (.1-.7)	.4 (.1-.7)	.3 (.05-.6)
IX. Nonpersistent, Floats, Volatile, Insoluble	X	.15 (0-.3)	.2 (.05-.5)	.45 (.2-.7)	.35 (0-.6)
X. Nonpersistent, Floats, Nonvolatile, Soluble	X	.4 (.2-.7)	.35 (.2-.8)	.55 (.3-.8)	.5 (.05-.6)
XI. Nonpersistent, Floats, Nonvolatile, Insoluble	X	.25 (.1-.4)	.25 (.01-.5)	.6 (.3-.8)	.5 (.1-.8)
XII. Nonpersistent, Mixer	X	.5 (.2-.8)	.5 (.1-.8)	.4 (.1-.8)	.35 (.05-.6)
XIII. Nonpersistent, Sinks, Soluble	X	.4 (.2-.8)	.4 (0-.8)	.3 (.1-.8)	.2 (.05-.4)
XIV. Nonpersistent, Sinks, Insoluble	X	.2 (.1-.5)	.25 (0-.4)	.15 (.01-.3)	.1 (0-.2)

SYMBOL KEY

BA = Bioaccumulation

AT = Damage to Living Resources

HHO = Hazard to Human Health (oral intake)

HHE = Hazard to Human Health (external exposure)

AM = Reduction of Amenities

( ) = Range

X = Not Applicable

TABLE I-1 (Cont'd.)

PHYSICAL/CHEMICAL PROPERTIES	RIVER				
	BA	AT	HHO	HHE	AM
I. Persistent, Floats, Volatile, Soluble	.3 (.2-.8)	.5 (.2-.8)	.4 (.2-.7)	.6 (.4-.8)	.45 (.2-.8)
II. Persistent, Floats, Volatile, Insoluble	.1 (.05-.8)	.35 (.1-.7)	.4 (.1-.6)	.6 (.4-.8)	.5 (.1-1.0)
III. Persistent, Floats, Nonvolatile, Soluble	.5 (.3-1.0)	.7 (.5-1.0)	.75 (.4-1.0)	.75 (.5-1.0)	.6 (.5-.8)
IV. Persistent, Floats, Nonvolatile, Insoluble	.3 (.1-.8)	.4 (.3-1.0)	.5 (.1-.7)	.7 (.5-1.0)	.7 (.4-1.0)
V. Persistent, Mixer	.55 (.3-.9)	.8 (.4-1.0)	.8 (.3-1.0)	.7 (.4-.9)	.6 (.4-.8)
VI. Persistent, Sinks, Soluble	.8 (.2-.9)	.75 (.3-1.0)	.8 (.1-1.0)	.55 (.2-.8)	.4 (.1-.6)
VII. Persistent, Sinks, Insoluble	.55 (.1-1.0)	.5 (.2-1.0)	.5 (0-.8)	.4 (.1-.7)	.15 (0-.5)
VIII. Nonpersistent, Floats, Volatile, Soluble	X	.35 (.1-.5)	.2 (.1-.5)	.35 (.2-.6)	.25 (.1-.5)
IX. Nonpersistent, Floats, Volatile, Insoluble	X	.2 (0-.3)	.15 (.1-.5)	.4 (.2-.6)	.3 (0-.6)
X. Nonpersistent, Floats, Nonvolatile, Soluble	X	.35 (.2-.7)	.45 (.1-.6)	.5 (.2-.6)	.5 (.1-.5)
XI. Nonpersistent, Floats, Nonvolatile, Insoluble	X	.2 (.1-.7)	.2 (.1-.5)	.5 (.2-.7)	.5 (.2-.7)
XII. Nonpersistent, Mixer	X	.6 (.2-.8)	.5 (0-.8)	.4 (.1-.7)	.3 (.2-.4)
XIII. Nonpersistent, Sinks, Soluble	X	.45 (.1-.7)	.5 (0-.7)	.3 (0-.6)	.2 (.1-.4)
XIV. Nonpersistent, Sinks, Insoluble	X	.3 (.1-.7)	.25 (0-.5)	.2 (0-.4)	.1 (0-.3)

TABLE I-1 (Cont'd.)

PHYSICAL/CHEMICAL PROPERTIES	ESTUARY			
	BA	AT	HNE	AM
I. Persistent, Floats, Volatile, Soluble	.4 (.2-.8)	.45 (.3-.8)	.55 (.1-.8)	.4 (.2-.8)
II. Persistent, Floats, Volatile, Insoluble	.2 (.1-.8)	.4 (.1-.7)	.6 (.1-.8)	.5 (.1-1.0)
III. Persistent, Floats, Nonvolatile, Soluble	.8 (.3-1.0)	.8 (.5-1.0)	.6 (.1-1.0)	.6 (.4-.9)
IV. Persistent, Floats, Nonvolatile, Insoluble	.4 (.1-.8)	.5 (.4-.8)	.6 (.3-1.0)	.75 (.4-1.0)
V. Persistent, Mixer	.6 (.4-.9)	.75 (.3-.9)	.55 (.2-.8)	.5 (.2-.7)
VI. Persistent, Sinks, Soluble	.9 (.3-1.0)	.9 (.4-.9)	.45 (.1-.7)	.4 (.2-.7)
VII. Persistent, Sinks, Insoluble	.75 (.2-1.0)	.9 (.2-1.0)	.3 (0-.5)	.25 (.1-.4)
VIII. Nonpersistent, Floats, Volatile, Soluble	X	.3 (.1-.5)	.3 (.1-.6)	.25 (.1-.6)
IX. Nonpersistent, Floats, Volatile, Insoluble	X	.2 (0-.3)	.4 (.1-.6)	.4 (0-.6)
X. Nonpersistent, Floats, Nonvolatile, Soluble	X	.35 (.2-.7)	.35 (.1-.6)	.4 (.2-.6)
XI. Nonpersistent, Floats, Nonvolatile, Insoluble	X	.25 (.1-.5)	.4 (.1-.6)	.45 (.2-.7)
XII. Nonpersistent, Mixer	X	.45 (.2-.8)	.2 (0-.7)	.25 (.1-.4)
XIII. Nonpersistent, Sinks, Soluble	X	.55 (.1-.8)	.25 (0-.7)	.2 (.05-.3)
XIV. Nonpersistent, Sinks, Insoluble	X	.55 (.1-.6)	.1 (0-.4)	.1 (0-.2)

TABLE I-1 (Cont'd.)

PHYSICAL/CHEMICAL PROPERTIES	COASTAL ZONE			
	BA	AT	NNE	AM
I. Persistent, Floats, Volatile, Soluble	.35 (.2-.8)	.3 (.2-.8)	.4 (.2-.8)	.35 (.1-.8)
II. Persistent, Floats, Volatile, Insoluble	.2 (.1-.8)	.2 (.1-.7)	.5 (.1-.8)	.45 (.1-1.0)
III. Persistent, Floats, Nonvolatile, Soluble	.5 (.3-1.0)	.7 (.4-1.0)	.7 (.3-1.0)	.55 (.2-.8)
IV. Persistent, Floats, Nonvolatile, Insoluble	.3 (.1-.8)	.45 (.1-.8)	.7 (.2-1.0)	.7 (.3-1.0)
V. Persistent, Mixer	.55 (.2-.8)	.7 (.3-1.0)	.5 (.2-.7)	.35 (.2-.6)
VI. Persistent, Sinks, Soluble	.7 (.2-1.0)	.65 (.2-1.0)	.3 (.1-.7)	.3 (.1-.5)
VII. Persistent, Sinks, Insoluble	.7 (.1-.9)	.55 (.1-.9)	.25 (0-.5)	.15 (0-.4)
VIII. Nonpersistent, Floats, Volatile, Soluble	X	.2 (.1-.5)	.3 (0-.5)	.25 (.1-.5)
IX. Nonpersistent, Floats, Volatile, Insoluble	X	.1 (0-.3)	.3 (0-.5)	.45 (0-.6)
X. Nonpersistent, Floats, Nonvolatile, Soluble	X	.3 (.1-.7)	.3 (0-.5)	.3 (.1-.6)
XI. Nonpersistent, Floats, Nonvolatile, Insoluble	X	.2 (.1-.5)	.4 (0-.6)	.45 (.1-.7)
XII. Nonpersistent, Mixer	X	.3 (.1-.8)	.3 (0-.7)	.2 (.1-.4)
XIII. Nonpersistent, Sinks, Soluble	X	.4 (.1-.7)	.15 (0-.6)	.15 (.05-.3)
XIV. Nonpersistent, Sinks, Insoluble	X	.25 (.1-.6)	.1 (0-.4)	.1 (0-.2)

ENCLOSURE I-1

PHYSICAL/CHEMICAL PROPERTIES

PERSISTENCE

Persistent Materials - Persistent materials are primarily those materials which are known to not be significantly degradable in the environment. For purposes of this study, we consider any hazardous material which is less than 10 percent degradable in five days (either biologically or chemically) as persistent. Certain materials whose hazard potential is associated with radical pH changes are considered non-persistent because of their anticipated dissipation by the alkalinity/acidity present in natural waters.

Non-Persistent Materials - This is any material which is not persistent (as defined above).

BEHAVIOR CLASSIFICATIONS

Mixers - This behavior group contains all hazardous materials which produce a significant amount of dissolved chemical (in a spill situation) in a relatively short period of time. In the absence of specific data on the behavior of a given chemical in a spill situation, all materials with solubilities greater than one percent and specific gravities between 0.9 and 1.2 have been placed in this group.

Floaters - This behavior group contains all those hazardous materials that will float on the surface of the water in a spill situation. In the absence of specific data on the behavior of a given chemical in a spill situation, all chemicals with solubility less than one percent and specific gravities less than 1.0 have been placed in this group.

Sinkers - This behavior group contains all those chemicals or reaction products that will sink to the bottom in a spill situation. In the absence of specific data on the behavior of a given chemical in a spill situation, all chemicals with solubilities less than one percent and specific gravities greater than 1.0 have been placed in this group.

SOLUBILITY

There is, of course, no clear line of demarcation between soluble and insoluble materials. For purposes of this study we have adopted the following convention.

Soluble - Any material whose solubility is greater than 0.1 percent (1000 ppm) is considered soluble.

Insoluble - Any material whose solubility is less than 0.1 percent (1000 ppm) is considered insoluble.

VOLATILITY

Volatile - This is any material for which significant dissipation from the water body through evaporation is expected. In the absence of specific data on the behavior of a given chemical in a spill situation, all chemicals with vapor pressures greater than 10 mm Hg at 10°C have been classified as volatile.

Non-Volatile - This is any material which is not volatile (as defined above).

ENCLOSURE I-2

HAZARD POTENTIALS

I. BIOACCUMULATION

Bioaccumulation occurs when an aquatic organism takes up a chemical to which it is exposed so that it contains a higher concentration of that substance than is present in the ambient water or its food. If the bioaccumulative material is toxic, a potential hazard exists not only to the organism but also to organisms at higher trophic levels (including man). Certain non-toxic bioaccumulative materials may produce tainting in aquatic organisms which may render the flesh of edible fish or shellfish unpalatable and/or interfere with consumer acceptability. For purposes of this study, only persistent materials can be bioaccumulative (i.e., non-persistent materials receive a score of zero).

II. DAMAGE TO LIVING RESOURCES

In considering the damage to living resources, we are primarily concerned with direct toxicity to aquatic life. The panel members are requested not to consider the longer range effects of hazardous material spills (effects on larvae, food organisms, etc.) since the critical concentrations used to profile hazardous materials were based on acute toxicity to fish and shellfish. Ratings in this category should consider benthic organisms such as clams, oysters, and crustaceans which have significant recreational and commercial value.

III. HAZARD TO HUMAN HEALTH (ORAL INTAKE)

This hazard potential deals with a situation in which a hazardous material spill into a waterway (or infiltrating into a groundwater supply) contaminates the water and thus poses a direct threat to human health through ingestion of the contaminated water. Coastal zones and estuaries are not considered under this hazard potential. The panel members should be aware of the fact that many hazardous materials are not removable by standard water treatment methods.

IV. HAZARD TO HUMAN HEALTH (EXTERNAL EXPOSURE)

This hazard potential deals with the ability of hazardous materials, their vapors, or aqueous solutions to cause irritation to skin, mucous membranes, and eyes. Contaminated beaches may be considered here; however, the evaluation should be based on the threat to people recreating on the

beach and not on aesthetic considerations. Other mechanisms of exposure include primary contact (swimming, water skiing, etc.) with aqueous solutions and exposure to vapor plumes.

V. REDUCTION OF AMENITIES

For our purposes, amenities are defined as values of the recreational use or scenic aspects of the environment. Reduction of amenities by hazardous material spills can occur in a number of ways including the presence of irritant or strong smelling vapors, objectionable scums or slicks, floating or suspended materials, and extensive discoloration of the water. As in other areas, the persistence of effect is quite important.

APPENDIX J

DERIVATION OF REPRESENTATIVE STREAM FLOW

The United States can be geographically subdivided into 24 principal drainage basins (Figure J-1), and each of these drainage basins can be classified into six annual runoff categories as indicated in Table J-1. The percentage of the total mean daily runoff in the United States contributed by the individual drainage basins can then be calculated by dividing the contribution from the basin by the total for the United States (Table J-2). The percentage of the total U. S. flow occurring from each runoff category (e.g., 0-5 inches) can be obtained by summing the individual drainage basin percentages for each category. Later in the text these runoff percentages will be utilized as weighting factors for each of the runoff categories (Table J-3). The weighting factors represent the percentage of the mean total daily flow which originates in basins falling within one of the six categories mentioned in Table J-1.

Within each category, representative river basins can be selected for detailed analysis. Basins selected for this study are listed in Table J-4. Each of these basins can be analyzed to obtain (as a final result) a curve which depicts the cumulative percentage of total water in the drainage basin (for median flow conditions) as a function of discharge. With such a curve one can select a percentage of water and determine a stream or discharge rate (X) in which the selected percentage of water flows. In terms of a harmful quantity determination for a given drainage basin, one can select a percentage of total water (e.g., 5 percent) which is too small to merit use in the model. The flow rate ($X_{0.05}$) associated with this percentage would be used as the threshold for calculation of the harmful quantity. The spillage of such a harmful quantity would result in substantial harm to the stream with the selected flow rate or less. Within the context of the DOHM plug flow model, streams with flow rates greater than $X_{0.05}$ would sustain substantial harm only from spillage of amounts larger than the harmful quantity.

Following this procedure the stream flow rates (X_i) from each of the selected stream systems can be combined in a weighted average to a given final flow rate (Q) representative of the entire nation. Mathematically the preceding takes the following form:

$$Q = W_1X_1 + W_2X_2 + \ldots + W_iX_i$$

where Q = representative discharge value to be applied in the DOHM model,

FIGURE J-1. PRINCIPAL DRAINAGE BASINS

TABLE J-1

MAJOR RIVER BASIN CATEGORIES

Average Annual Runoff (inches)	Drainage Basin
0-5	Great Basin Colorado Upper Missouri-Hudson Bay Upper Arkansas-Red Eastern Pacific N.W. Western and Central Western Gulf
5-10	Eastern Western Gulf Lower Missouri Upper Mississippi Southern California
10-20	Lower Arkansas-Red-White Lower Mississippi Ohio Western Great Lakes Easter Great Lakes South antic Spokane & Upper Snake
20-30	New England Eastern Gulf Cumberland-Tennessee Northern California
30-40	Delaware-Hudson Chesapeake
> 40	Pacific Northwest

TABLE J-2

APPROXIMATE MEAN RUNOFF BY SUB-BASINS[5]

Basin Classification (Runoff in Inches)	Drainage Basin	Approximate Area (Sq. Mi.)	Natural Runoff* MGD per Sq. Mi.	MGD	Percent of Total Flow
0-5	Great Basin	191,800	0.042	8,100	0.6
	Colorado	255,300	0.044	11,300	0.9
	Upper Missouri-Hudson Bay	509,100	0.058	29,700	2.4
	Upper Arkansas-Red	171,500	0.088	15,100	1.3
	Eastern Pacific N.W.	122,000	0.124	15,500	1.3
	Western and Central Western Gulf	214,100	0.113	28,400	2.4 Subtotal 8.9
5-10	Eastern Western Gulf	83,000	0.34	28,400	2.4
	Lower Missouri	54,100	0.43	23,400	2.1
	Upper Mississippi	184,800	0.34	63,400	5.4
	Southern California	62,000	0.24	14,300	1.2 Subtotal 11.1
10-20	Lower Arkansas-Red-White	112,600	0.70	78,600	6.7
	Lower Mississippi	61,900	0.81	50,200	4.3
	Ohio	103,400	0.78	111,400	9.5
	Western Great Lakes	89,500	0.48	43,200	3.6
	Eastern Great Lakes	48,200	0.85	40,900	3.5
	South Atlantic	151,000	0.53	179,200	6.7
	Sprague & Upper Snake	50,100	0.63	31,600	2.7 Subtotal 37.0
20-30	New England	62,500	1.09	67,900	5.7
	Eastern Gulf	123,300	1.09	135,500	11.5
	Cumberland-Tennessee	60,300	1.00	60,500	5.1
	Northern California	60,000	0.80	48,000	4.0 Subtotal 26.3
30-40	Delaware-Hudson	36,500	0.91	33,300	3.3
	Chesapeake	67,600	0.77	52,000	4.4 Subtotal 7.7
>40	Pacific Northwest	75,000	1.4	105,500	9.0 Subtotal 9.0

*Estimated from natural precipitation minus evaporation

Total = 1,175,600

[5]"Has the United States Enough Water?", U. S. Geological Survey Water Supply Paper 1797, USGPO, Washington, DC, 1965.

TABLE J-3

WEIGHTING FACTORS

Average Annual Runoff (inches)	Weighting Factor (W_i)
0-5	0.089
5-10	0.111
10-20	0.370
20-30	0.263
30-40	0.077
> 40	0.09
Total	1.00

TABLE J-4

SELECTED REPRESENTATIVE RIVER BASINS

Average Annual Runoff (inches)	River Basins
0-5	Brazos; Loup
5-10	Sangamon; Neches
10-20	Upper Snake; Roanoke
20-30	Merrimack; Tuolumne
30-40	Susquehanna
> 40	Willamette; Skagit

W_i = fractional weighting factor, based upon a drainage basin's average annual runoff category, and

X_i = individual stream flow values for each average annual runoff category.

The majority of the streams selected as being representative of the six average annual runoff categories were investigated by Stall and Yang[1] in a study conducted for the Illinois State Water Survey and the U. S. Department of the Interior. The authors studied twelve selected stream systems within the United States and developed hydraulic geometry equations to calculate discharge (Q), cross-sectional area (A), width (W), depth (D), and velocity (V) as functions of discharge frequency (F) (percent of days per year that the discharge was equaled or exceeded), and the drainage area (Ad-square miles).

The study investigated streams and rivers under a variety of physiographic and hydraulic conditions. The seasonal distribution of runoff for the streams investigated ranged from 5-10 inches of runoff to >40 inches of runoff. The authors did not address the arid zone (<5 inches of annual runoff) because of the complexity of the hydraulic geometry patterns which are frequently altered by flash floods. Streams representing these arid areas were evaluated by Battelle-Northwest utilizing actual drainage basin data, and this procedure is described later in this text.

The procedure for formulating the hydraulic geometry relationships utilized in Stall and Yang's study included the following components.

- Identification of the number of gage stations within the basin which had adequate records, and synthetic expansion of those gage station records which have fewer values than the chosen "standard" period.
- Development of a hydraulic rating curve for each gage station. These curves contained actual cross-sectional areas, widths, depths, and velocities plotted against discharge.
- Development of flow duration curves for each gage station based upon existing and synthetically produced data. Flow duration curves consisted of discharge values plotted against the percent of days the discharge was equaled or exceeded within the basin.

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[1]Stall, J. B. and C. T. Yang. "Hydraulic Geometry of Twelve Selected Stream Systems of the United States," University of Illinois, Water Resources Center, Research Report No. 37, July 1970.

- Utilization of the hydraulic rating and flow duration curves in conjunction with the drainage area (Ad) for each gage station to plot the parameters of interest (W, Q, V, A, and D) versus drainage area (Ad) for various frequencies of discharge.

- Fitting a curve to the data plotted in the parameter versus drainage area graph. All frequency curves were fitted as one total least squares multiple regression to the points that define each curve. The fitting process was carried out mathematically using the natural logarithm of the parameter (P) as the dependent variable and the values of frequency (F) and the natural logarithm of the drainage area (Ad) as independent variables (e.g., $\ln P = a + bF + c \ln Ad$). A mathematical fitting was carried out for all the parameters (Q, A, W, V, and D).

The acceptability of a gage station's records was based on several criteria. Records were not used if

- there was diversion into or out of the basin above the gage in an amount equivalent to 10 percent of the lowest daily discharge of record,

- there was upstream regulation affecting as much as 20 percent of the drainage area of the gaging station, and

- the gage station had less than three years of record.

Once the stations which had recorded usable data were identified, a standard period of record was selected for each drainage basin (ranging from 15 to 46 years). The standard period was selected to make maximum use of the records available, as well as to provide a reasonable areal coverage of the basin.[1] The data from stations with records less than the standard number of years were expanded synthetically.

The synthesizing method utilized to extend the data has been described by several authors. The procedure consists of choosing an index gage station which has complete records for the standard and developing graphs that depict the discharges at other (secondary stations) as a function of the known discharge at the index station (Figure J-2). Once this plot is established, the index station's discharge can be utilized to locate the "synthesized" discharge at a secondary gage station.

From hydraulic rating curves (Figure J-3) (which are graphical representations of actual gage station data), formulae of the following form can be constructed to describe the gage station's value for width (W), depth (D), velocity (V), and cross-sectional area (A) as functions of discharge (Q).

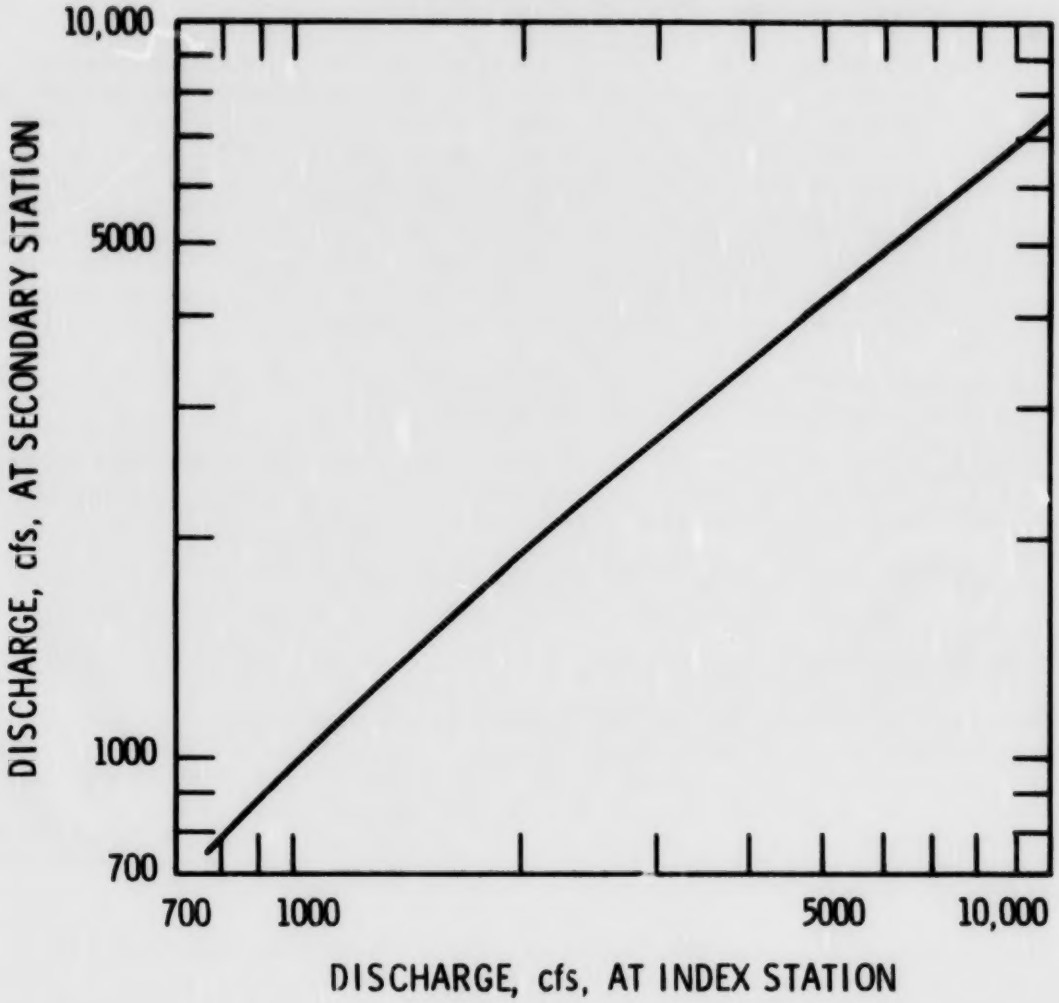

FIGURE J-2. SAMPLE CURVE-OF-RELATION FOR CORRELATING FLOWS BETWEEN THE INDEX STATION AND SECONDARY STATION[2]

[2]Leopold, L. B. "Rivers," American Scientist, Vol. 50, No. 4, pp. 511-537, 1962.

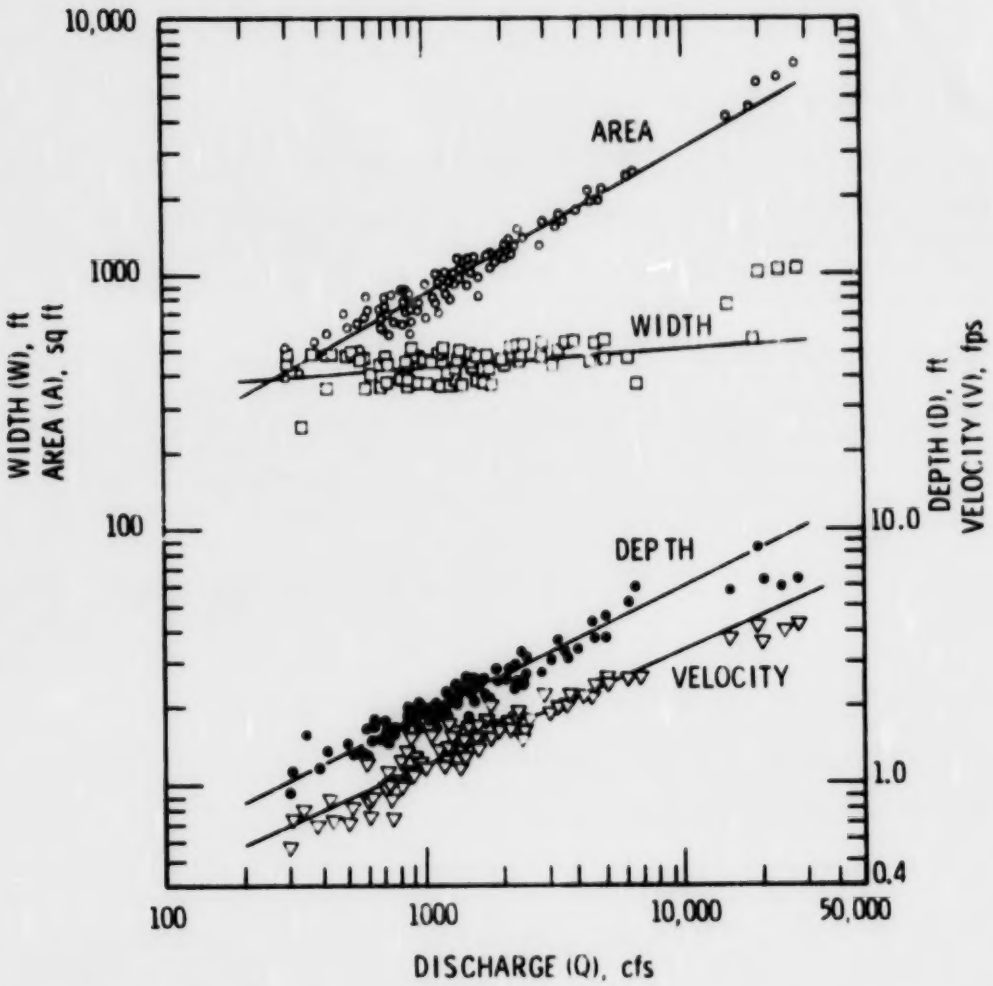

FIGURE J-3. TYPICAL HYDRAULIC RATING CURVES[1]

$$W = a\ Q^b$$

$$D = c\ Q^f$$

$$V = k\ Q^m$$

$$A = d\ Q^n$$

where Q = discharge, and

a, b, c, d, f, k, m, and n are numerical constants.

From the flow duration curves of each gage station (Figure J-4), the values of discharge (Q) for any desired frequency can be obtained and the preceding formulae utilized to calculate the corresponding values of W, D, V, and A.

For each drainage basin and any parameter (Q, W, D, V, or A), a log-log plot of the parameter versus the gage station's drainage area (Ad) for given discharge frequencies (F) can be developed. Figure J-5, for example, plots discharge (Q) in relation to area (Ad) for two frequencies (0.1 and 0.9). A hydraulic geometry curve is then fitted to the data points through a least squares multiple regression.

The multiple regression equation utilized is of the form:

$$\ln P = a + bF + c \ln Ad$$

where P = parameter of interest (Q, W, D, V, or Ad),

F = frequency of occurrence,

Ad = drainage area (square miles), and

a, b, c = numerical constants.

From the flow duration charts, the discharge vs drainage area charts, and the index to secondary station correlations, median (F = 0.5) discharge values were determined for each gage station. These values were in turn used to obtain velocity (V) and cross-sectional area (A) values from the hydraulic rating curves (see Figure J-3). With these values it is possible to estimate the amount of water in the stream when the flow in the stream is equal to the median discharge value.

Figure J-6 illustrates a hypothetical drainage basin where gage stations, A, B, and C are located. Distances L_{AB}, L_B, and L_C exist between the gage stations or the gage station and the headwaters. Utilizing the hydraulic geometry relationships

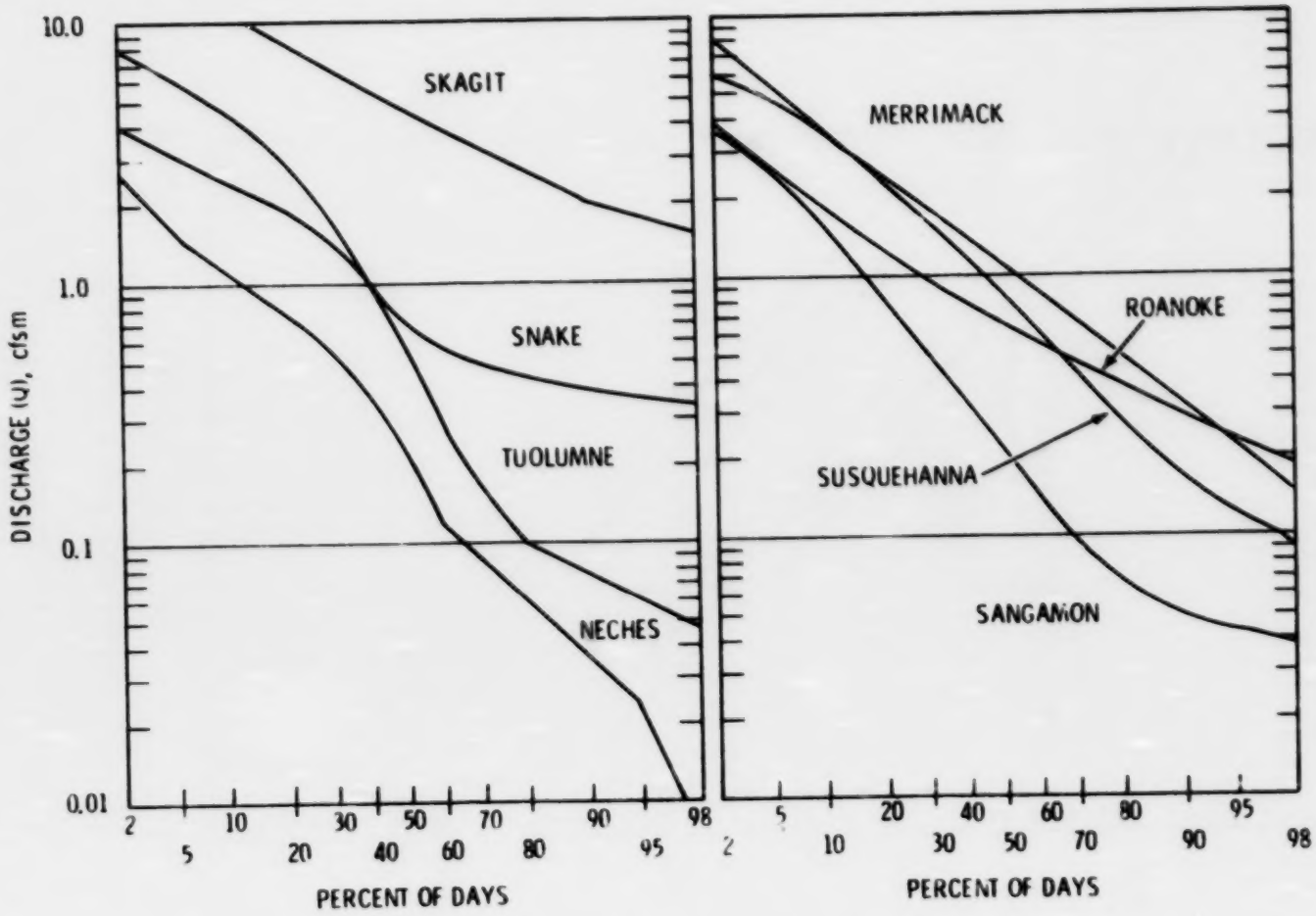

FIGURE J-4. TYPICAL FLOW DURATION CURVES FOR THE BASINS ANALYZED BY STALL AND YANG[1]

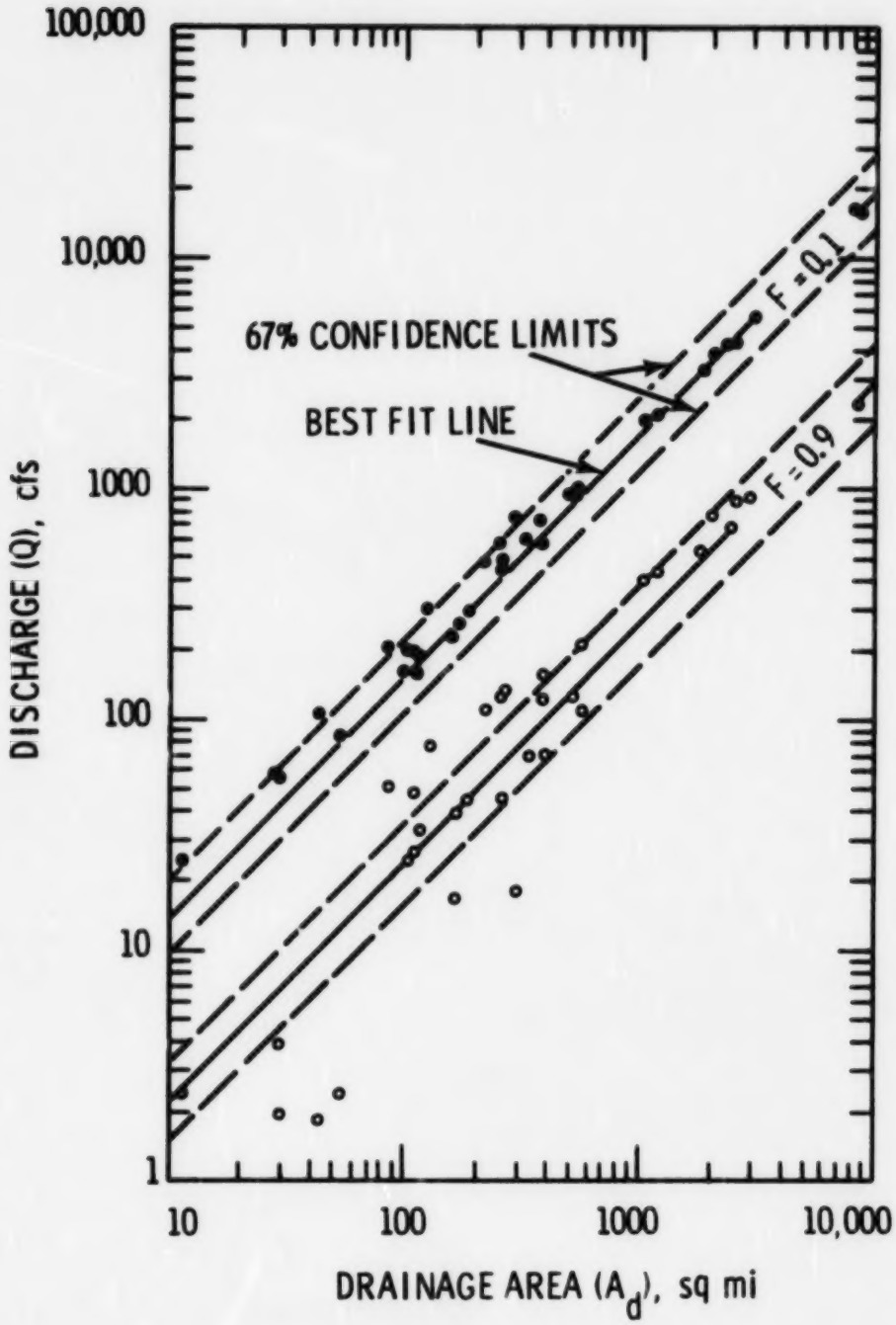

FIGURE J-5. DISCHARGE AS RELATED TO DRAINAGE AREA FOR TWO FREQUENCIES SHOWING THE 67 PERCENT CONFIDENCE INTERVALS[1]

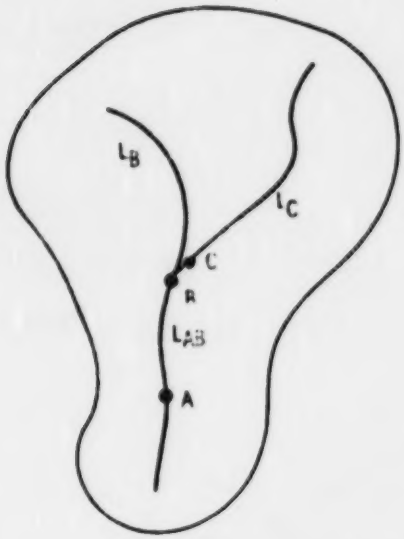

FIGURE J-6. IDEALIZED DRAINAGE BASIN

developed by Stall and Yang, the discharge (Q) and corresponding velocity (V) can be developed for the median flow rate (F = 0.5) and a given drainage area at each gage station. The volume of water represented in the length, L_C, could then be calculated by idealizing the river as illustrated in Figure J-7. This form is represented by a pyramid and the volume of the pyramid can be calculated from:

$$\text{Volume} = \text{Vol}_C = \frac{1}{3} \frac{Q_C}{V_C} L_C$$

where Q_C/V_C = cross-sectional area (A_C) at point C.

The volume of water located between gage station A and B would be calculated utilizing the following technique:

$$\text{Volume} = \text{Vol}_{AB} = \left(\frac{\frac{Q_A}{V_A} + \frac{Q_B}{V_B}}{2} \right) L_{AB}$$

The volume of water, Vol_C, is flowing at an average median discharge of $Q_C/2$ and the volume of water, Vol_{AB}, is flowing at an average median discharge of $(Q_A + Q_B)/2$.

Utilizing the preceding formulae, the volume of water existing in each tributary or reach of a river basin at a specific median discharge value can be calculated. In order to accomplish these calculations, a river basin map indicating gage station locations and river miles must be utilized. Unfortunately, such maps do

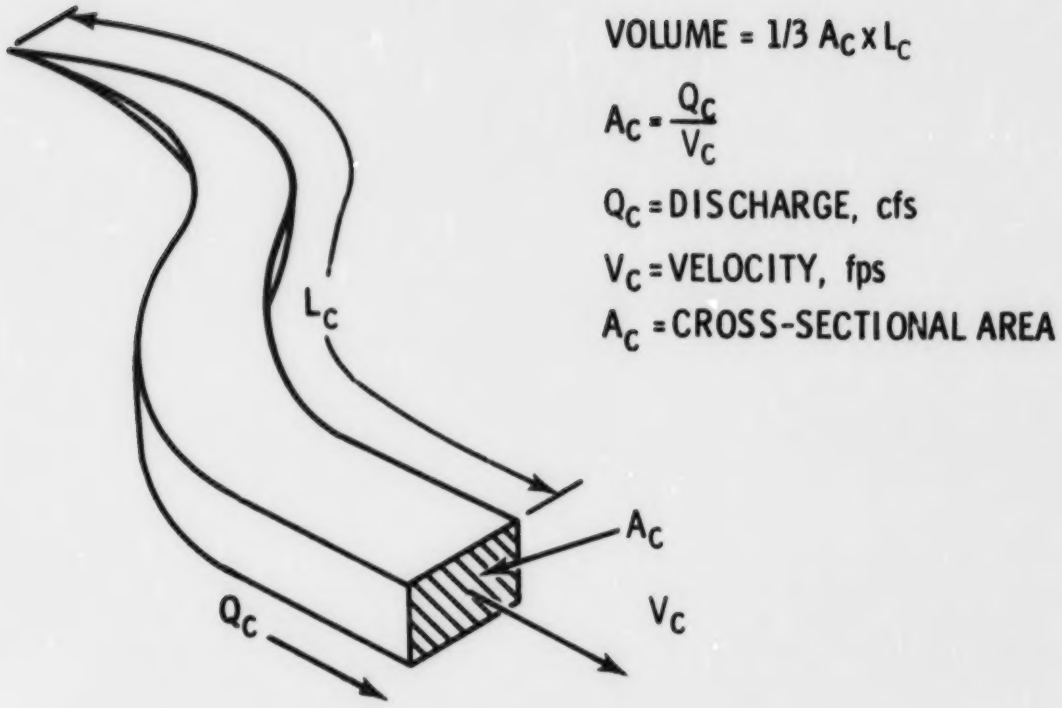

FIGURE J-7. IDEALIZED STREAM FROM GAGE STATION TO HEADWATERS

not normally indicate the smaller sized tributaries. In order to estimate the volume represented by the smaller tributaries (drainage areas on the order of 1 to 5 square miles[2]), the relationships of Horton and Strahler[3] were utilized.

Horton, and later Strahler,[3] have shown that a relationship exists on semi-log paper between stream orders and the number of such streams (Figure J-8). Hence, if the number of streams of large order for a basin are known, then the number of smaller order tributaties are known, the volume of water which they represent at the median flow rates (F = 0.5) can be determined by utilizing generalized drainage area data for small order streams (for streams of order 1, Ad $\sim$ 1 square mile, streams of order 2, Ad $\sim$ 4.7 square miles[2]).

Stall and Yang[1] calculated the higher stream orders for the rivers they investigated and the preceding methodology s utilized to determine the number of smaller order streams.

Once the preceding volume formulae and methodology were utilized to calculate the volume of water existing within the entire river

[3]Leopold, L. B., et al. Pluvial Processes in Geomorphology, W. H. Freeman & Co., San Francisco, CA, 1964.

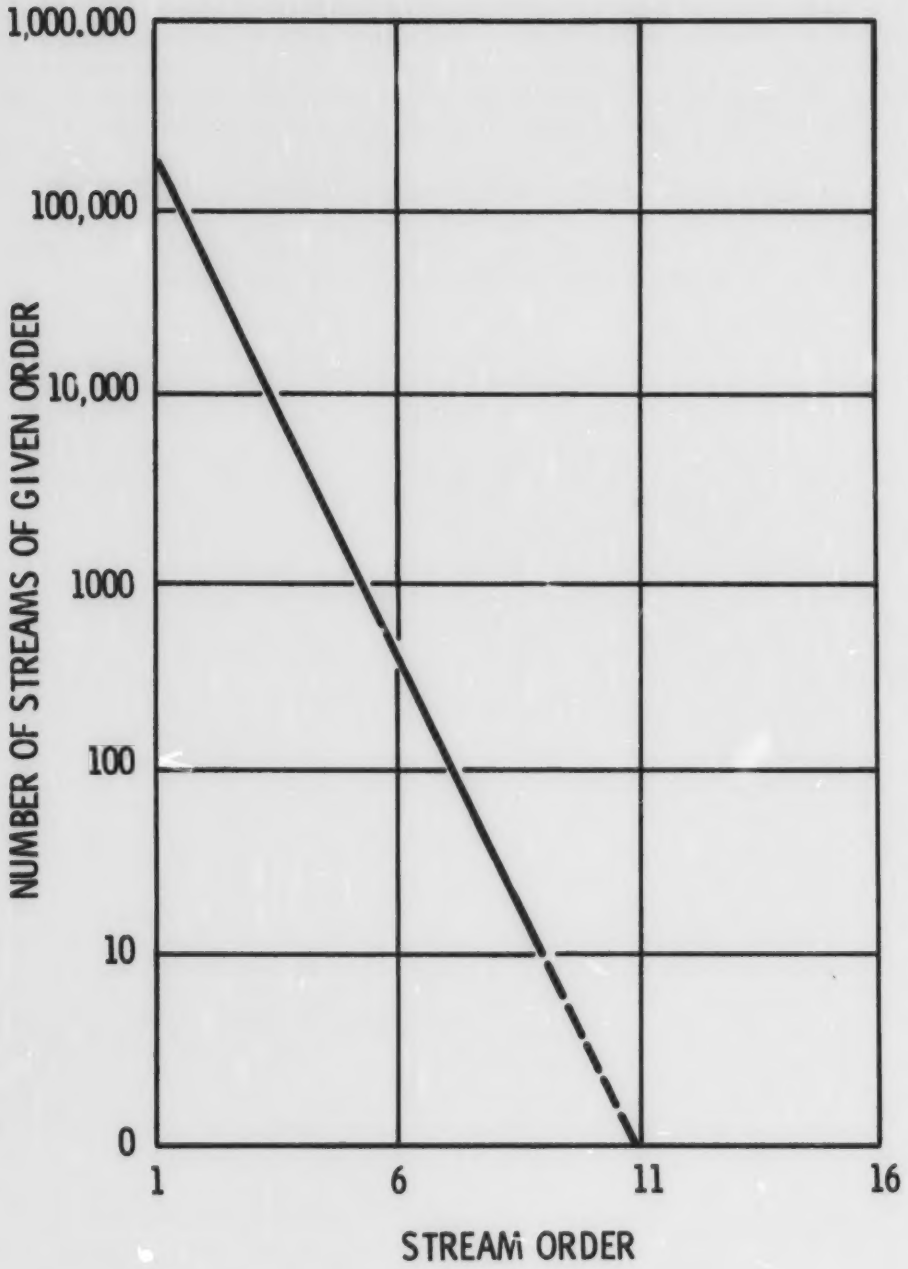

FIGURE J-8. RELATIONSHIP BETWEEN STREAM ORDERS AND NUMBER OF STREAMS

basin based upon the median flow rates, the corresponding discharges were ranked from highest to lowest with their respective volumes. Then the volume figures were added to obtain a total figure for the basin. The total volume figure was divided into each discharge's corresponding volume to yield a percentage. The percentages were added to develop an accumulative percentage (based on the ranking of discharge values from high to low).

In order to supplement Stall and Yang's[1] work, a different methodology was utilized to determine the volume represented by various discharges for two streams within the 0-5 inch runoff classification and for the Willamette River (>40 inches of runoff).

Data from USGS water supply papers for various gage stations within the preceding river basins and their corresponding river basin maps were utilized in order to determine lengths and mean discharge values for the tributaries and reaches. The median discharge values were assumed to be roughly fifty percent of the mean discharge values and this approximation was utilized to reduce the mean to median values."

"Riggs, H. C. "Frequency Distribution of Stream Miles by Flow Rate," Open File Report, U. S. Geological Survey, Water Resources Division, Washington, DC, 1973.

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1. Stall, J. B. and C. T. Yang. "Hydraulic Geometry of 12 Selected Stream Systems of the United States," University of Illinois, Water Resources Center, Research Report No. 32, July 1970.

2. Leopold, L. B. "Rivers," American Scientist, Vol. 50, No. 4, pp. 511-537, 1962.

3. Leopold, L. B., et al. Pluvial Processes in Geomorphology, W. H. Freeman & Co., San Francisco, CA, 1964.

4. Riggs, H. C. "Frequency Distribution of Stream Miles by Flow Rate," Open File Report, U. S. Geological Survey, Water Resources Division, Washington, DC, 1973.

5. "Has the United States Enough Water?", U. S. Geological Survey Water Supply Paper 1797, USGPO, Washington, DC, 1965.

APPENDIX K

ESTUARINE TYPES AND MODEL DERIVATION

The three major types of estuaries are discussed below. A model of a partially mixed estuary is analyzed and a formula developed for computing the harmful quantity as a function of salinity and fresh water inflow rate.

SALT WEDGE ESTUARY

When the inflow of fresh water is large with respect to the tidal discharge, the fresh and salt water tend to remain separate with the fresh water flowing out to sea over the top of the salt water layer and the salt water layer intruding underneath the fresh water in a rough wedge shape.[1] If friction were completely absent, the interface would remain horizontal and extend upriver to the point where the river bed was at sea level. The existence of friction causes the interface to slope slightly downwards in the upstream direction.[2] The steep density gradient at the interface, amounting to a discontinuity, reduces the turbulence and mixing to a very low level (Figure K-1).[2]

At high river flow rates, interfacial waves form between the fresh surface water and the underlying salt water wedge. These waves will tend to break and lead to an entrapment of some of the salt water from the wedge into the upper fresh water layer. In this situation, there is little or no admixture of fresh water into the salt water wedge, only the upward migration of salt water into the fresh water layer. Increased flow causes additional frictional drag at the interface and retards the upstream protrusion of the wedge, so that it no longer extends as far as the fall line.[3] The greater the river flow, the further downstream the upper edge of the wedge is found. Within the wedge, increased upstream flow occurs to compensate for the increased loss of salt water upward into the freshwater upper layer.

A spill of material with a low density (specific gravity <1.0) will be rapidly flushed from the area. On the other hand, the introduction of a dense material into the estuary may lead to entrainment in the salt wedge with slow exchange with the overlying freshwater and a slow exchange with uncontaminated ocean water caused by the oscillatory motion of the tides. Thus the

[1] Semons, N. B. "Field Experience in Estuaries," Estuary and Coastline Hydrodynamics, McGraw-Hill Inc., pp. 673-690, 1966.
[2] Bowden, K. F. "Circulation and Diffusion," Estuaries, American Association for the Advancement of Science, pp. 15-36, 1967.
[3] Pritchard, D. W. "Estuarine Circulation Patterns," ASCE, Hydraulics Division, pp. 717-1 - 717-11, June 1955.

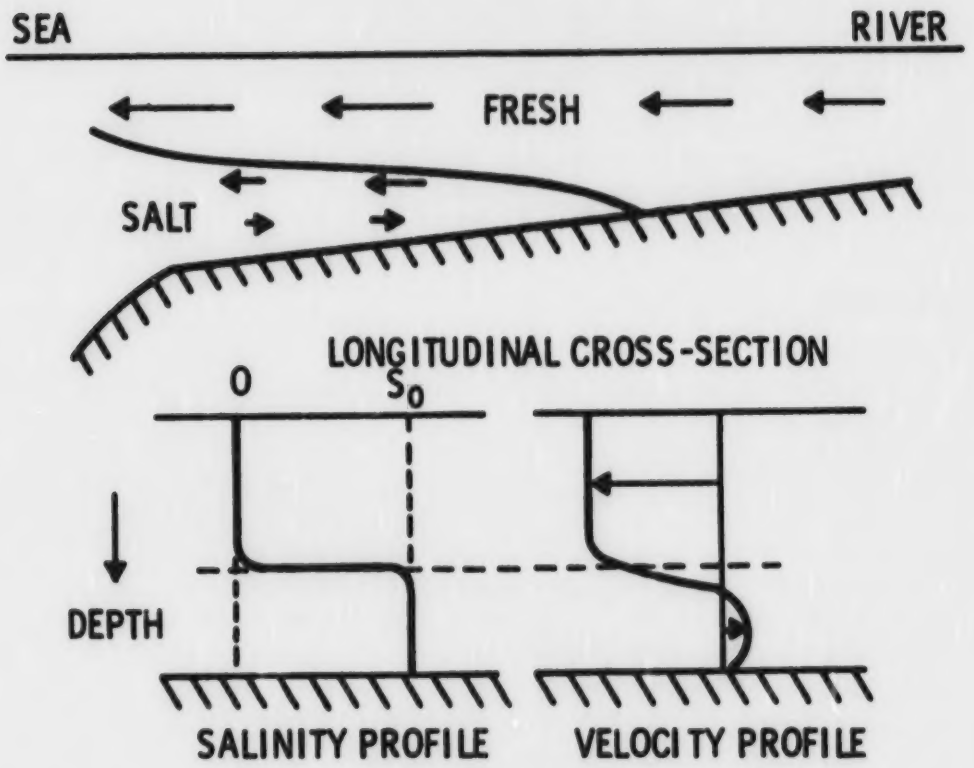

FIGURE K-1. SALT WEDGE ESTUARY

depth location of the spill will dictate the rate of expulsion from the estuary. However, the spillage of a relatively light material into the subsurface salt wedge may result in an increase in dilution of the substance's concentration by entrainment of the estuarine waters as the plume of material rises from the estuary's bed.

PARTIALLY MIXED ESTUARY

In comparatively shallow estuaries affected by tidal currents of increasing amplitude, vertical mixing extends throughout the depth, mixing freshwater downwards and the more saline water upwards. Two layers of flow still exist. The surface of no motion separating the seaward-flowing upper layer from the landward-flowing lower layer usually occurs somewhat above mid-depth (Figure K-2).[2]

No marked interface exists, but the salinity profile shows a continuous increase in salinity from surface to bottom, the maximum gradient occurring near the level of no net motion.[2] The area of maximum rate of change is relatively stable. However, the density gradient is not sufficiently sharp to completely inhibit vertical mixing between the surface layer and bottom layer.

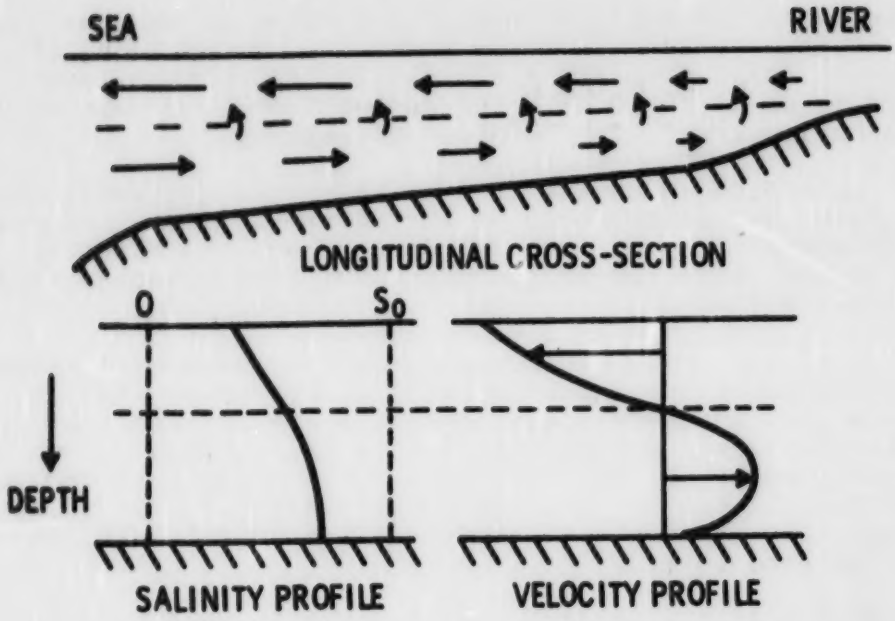

FIGURE K-2. PARTIALLY MIXED ESTUARY WITH ENTRAINMENT

The controlling parameter in this class of estuary is the ratio of the amplitude of tidal currents to the river inflow and, therefore, a wide range in the degree of stratification occurs. The total increase in salinity from surface to bottom may be as much as 10 ppt while in others it is less than 1 ppt.[1] Within a given estuary, large variations may occur in the conditions with changes in river flow, and smaller but significant differences between periods of spring and neap tides.[2]

Within the estuary a net seaward flow exists at the surface layers, and a net flow directed from the mouth towards the head of the estuary in the deeper layers. Furthermore, a small net vertical motion directed from the deeper layers to the surface layers exists. The volume rate of seaward flow in the surface layers increases as one proceeds from the head towards the mouth of the estuary.[4]

A pollutant initially introduced into the bottom layers in a partially mixed estuary, in addition to participating in the oscillatory movement of the tidal currents, is carried in the net motion towards the head of the estuary.[5] The pollutant which

[4]Pritchard, D. W. "Observation of Circulation in Coastal Plan Estuaries," Estuaries, American Association for the Advan ement of Science, pp. 37-51, 1967.
[5]Pritchard, D. W. "Dispersion and Flushing of Pollutants in Estuaries," J. Hydraulics Division, ASCE, pp. 115-124, January 1969.

becomes mixed with the surface layers is carried in the net flow toward the mouth. Seaward from the point of introduction, the pollutant being carried toward the ocean in the surface layers is partially mixed downward into the deeper layer and reintroduced into layers moving toward the head of the estuary.[5]

A pollutant introduced into the surface layers is initially carried in the net flow toward the mouth of the estuary. Turbulent mixing leads to horizontal and vertical dispersion, and the materials are also added to the deeper layers having a net flow directed toward the head of the estuary.[5]

In the region of the estuary headward from the point of introduction, the concentrations of the pollutant will always be greater in the deeper layers than in the surface layers, while seaward from the point of introduction the converse will be true. These conditions prevail regardless of whether the wastes are initially introduced into the surface layers or into the deeper layers.[5] The pollutant is ultimately flushed from the estuary in the seaward-directed flow of the surface layers.[5]

The subsequent fate of a pollutant will be influenced by the physical properties of the contaminant, the rate of discharge, and the depth of introduction.[5] If the density of the contaminant is less than that of the receiving waters, and the material is introduced at the surface of the estuary, vertical mixing of the contaminant with the receiving waters will be inhibited. However, if such a contaminant is introduced into the estuary near the bottom, the material will initially rise as a buoyant plume, entraining dilution water from the environment enroute to the surface. Since the estuary is seldon deep enough so that the ascending plume reaches the density of the receiving waters at an intermediate depth, the plume will spread out on the surface still somewhat lower in density than the surrounding estuarine waters.[5]

Each reversal of the tidal current will result in a folding back of the spreading plume. However, because of the large scale turbulent eddies, the plume will seldom fold exactly upon itself and will normally follow a different path on successive tides.[5] Thus, there will develop a widespread contaminated field of relatively low concentration on which is superimposed, during each tide, a relatively narrow plume of higher concentration.[5]

WELL-MIXED ESTUARY

In a well-mixed estuary, the tidal forces predominate over the freshwater inflow to such an extent that the fresh and salt water are fairly well mixed throughout the vertical. Salinities decrease horizontally from sea water at the entrance to fresh water in the upper reaches and bottom salinities normally exceed those at the surface by 15 to 25 percent.[4]

The currents reverse with tidal phase throughout the estuary. In the fresh and brackish water regions, ebb currents at all depths predominate over flood currents because of the freshwater discharge. In the intermediate and highly saline regions, however, the bottom flood currents usually predominate slightly over the bottom ebb currents.[4] Very few estuaries fit this idealized situation.

MODEL EQUATION DERIVATION

Applying a salt and water balance to the estuarine plug flow model developed in Chapter VII, HQ=K (QT + RP/D) (T) (C) (S) will result in simplifying the necessary input data to the basic model. In order to apply such a balance the following terms must be defined[6]

Vf = total water volume entering the estuary on the flood tide

Vfe = portion of Vf which flowed out of the estuary on the previous ebb

Vo = volume of new ocean water entering the estuary during flood tide

Vt = volume of fresh water added by the tributary

Ve = volume of water leaving the estuary in the ebb tide

Sf = average salinity of water entering the estuary on the flood tide (equivalent to total salt in estuary divided by total estuarine volume).

Se = average salinity of water leaving the estuary on the ebb tide

So = salinity of the ocean water.

For continuity of salt and water to hold

$$SfVf = SeVfe \qquad (K\text{-}1)$$

$$Vf + Vt = Ve \qquad (K\text{-}2)$$

and,

$$SfVf = SeVfe + SoVo \qquad (K\text{-}3)$$

$$Vf = Vfe + Vo \qquad (K\text{-}4)$$

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[6]Fischer, H. B. Affidavit concerning Section 307, for the Environmental Protection Agency.

and the tidal exchange ratio can be defined as

$$R = Vo/Vf \qquad (K\text{-}5)$$

Substituting (K-2) into (K-3)

$$SfVf = Se(Vf - Vo) + SoVo$$

$$\text{or, } \frac{Vo}{Vf} = \frac{Sf - Se}{So - Se} = \left(\frac{Se}{So - Se}\right)\left(\frac{Sf - Se}{Se}\right) \qquad (K\text{-}6)$$

Substituting (K-2) into (K-1) yields

$$SfVf = Se(Vf + Vt)$$

$$\text{or } \frac{Vt}{Vf} = \frac{Sf - Se}{Se}$$

Substituting into (K-6)

$$\frac{Vo}{Vf} = \left(\frac{Se}{So - Se}\right)\ \frac{Vt}{Vf} = R$$

Since $Vt = (Qt)D$ and $P = Vf$, therefore $R = \left(\frac{Se}{So - Se}\right)\left(\frac{QtD}{P}\right)$

Substituting the preceding equation into VII-4 yields

$$H > K\left[Qt + \left(\frac{Se}{So - Se}\right)\left(\frac{QtD}{P}\right)\left(\frac{P}{D}\right)\right](T)(C)$$

rearranging

$$H > KS\left(\frac{So}{So - Se}\right)\ Qt)(T)(C) \qquad (K\text{-}7)$$

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1. Semons, N. B. "Field Experience in Estuaries," Estuary and Coastline Hydrodynamics, McGraw-Hill Inc., pp. 673-690, 1966.

2. Bowden, K. F. "Circulation and Diffusion," Estuaries, American Association for the Advancement of Science, pp. 15-36, 1967.

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4. Pritchard, D. W. "Observation of Circulation in Coastal Plan Estuaries," Estuaries, American Association for the Advancement of Science, pp. 37-51, 1967.

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6. Fischer, H. B. Affidavit Concerning Section 307, for the Environmental Protection Agency.

APPENDIX L

DERIVATION OF THE TIME AT WHICH THE MINIMUM HARMFUL QUANTITY IS OBTAINED IN THE PLUG FLOW MODEL

It has been stated in Chapter VII that the minimum harmful quantity for a substance will occur under conditions requiring an exposure time of less than six hours. In order to establish this, one must analyze the basic relations involved. The plug flow model can be written as

$$HQ = k_o QCT \qquad \text{(L-1)}$$

where HQ = harmful quantity

k_o = constant for conversion of units, value depends on units employed.

Q = flow rate of the receiving water, a selected constant

C = critical concentration for a substance

T = time of passage for the plug.

The relation can be simplified to

$$HQ = k_1 CT \qquad \text{(L-2)}$$

since Q is held constant, but both C and T are time dependent variables. In order to determine the point where a minimum HQ will occur, the relation must be converted to one varying only in time, T. To do this, it is necessary to establish the relation between C and T. In a review of time-dose mortality relations which describe the empirically determined relation between time and dose, Wuhrmann[1] and others[2] have noted that the time-dose relation can be described mathematically in the form

$$(C-C_s)^n (t-t_s) = k_2 \qquad \text{(L-3)}$$

where C_s = incipient toxicity threshold (a constant see glossary)

t_s = incipient time threshold (a constant see glossary)

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[1]Wuhrmann, K. "Concerning Some Principles of the Toxicology of Fish," Bull. Cent. Gelge Dacum, Eaux, No. 15: 49, 1952. (Fisheries Research Board of Canada Translation Series, No. 243).

[2]Alabaster, J. S. and S. H. Abram. "Development and Use of a Direct Method of Evaluating Toxicity to Fish," Advances in Water Pollution Research, Proceedings 2nd International Conference, Tokyo, August 1964, Vol. I, 1965.

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t = time variable

k_2 = constant for any given chemical

n = constant for any given chemical, no units

Rearranging,

$$t = k_2(C-C_s)^{-n} + t_s \qquad \text{(L-4)}$$

This can now be substituted into the simplified plug flow equation to yield

$$HQ = k_1k_2(C-C_s)^{-n}C + k_1Ct_s \qquad \text{(L-5)}$$

since T = t for the two relations.

The minimum will occur where the derivative has a value of zero; therefore, at the minimum

$$dHQ/dC = -nk_1k_2(C-C_s)^{-n-1}C + k_1k_2(C-C_s)^{-n} + k_1t_s = 0 \qquad \text{(L-6)}$$

or,

$$-nk_2(C-C_s)^{-n-1}C + 1k_2(C-C_s)^{-n} + t_s = 0 \qquad \text{(L-7)}$$

and

$$k_2\,(C-C_s)^{-n-1}[(C-C_s) - nC] + t_s = 0 \qquad \text{(L-8)}$$

It is the time of passage (or exposure time) which must be determined at the minimum point and, therefore, the following transforms from equation (L-3)

$$(C-C_s)^{-n} = \frac{t-t_s}{k_2},\quad (C-C_s)^{-1} = \left(\frac{t-t_s}{k_2}\right)^{1/n}$$

$$C = \left(\frac{k_2}{t-t_s}\right)^{1/n} + C_s$$

can be substituted into equation (L-8) to get

$$k_2\,\left(\frac{t-t_s}{k_2}\right)\,\left(\frac{t-t_s}{k_2}\right)^{1/n}\,\left[\left(\frac{k_2}{t-t_s}\right.^{1/n} - n\,\left(\frac{k_2}{t-t_s}\right)^{1/n} - nC_s\right] + t_s = 0 \qquad \text{(L-9)}$$

$$(t-t_s)\,\left(\frac{t-t_s}{k_2}\right)^{1/n}\,\left[\left(\frac{k_2}{t-t_s}\right)^{1/n} - n\,\left(\frac{k_2}{t-t_s}\right)^{1/n} - nC_s\right] + t_s = 0 \qquad \text{(L-10)}$$

$$(t-t_s)\,\left[1-n-nCs\,\left(\frac{t-t_s}{k_2}\right)^{1/n}\right] + t_s = 0 \qquad \text{(L-11)}$$

If the term $nCs\ (\frac{t-t_s}{k_2})^{1/n}$ is sufficiently less than 1-n it can be treated as 0 and removed from the expression. This simplification will be verified at the end of the proof.

Consequently,

$$(t-t_s)\ (1-n) + t_s = 0 \qquad \text{(L-12)}$$

$$t-t_s-nt + nt_s + t_s = 0 \qquad \text{(L-13)}$$

$$t\ (1-n) + nt_s = 0 \qquad \text{(L-14)}$$

$$t = \frac{nt_s}{n-1} \qquad \text{(L-15)}$$

Empirical data from time-dose mortality tests reveals that n always has a negative value. Consequently, the time value (t) associated with the minimum HQ will always be less than the incipient time threshold(t_s). Empirical data also reveal that for the hazardous substances studied, t_s never exceeds one hour. Hence, the minimum harmful quantity will never occur at a time of exposure in excess of six hours unless the term L-16 dropped out of equation L-11 is found to be significant. To check this, the values obtained for the various parameters will be placed back into the expression

$$nCs\ (\frac{t-t_s}{k_2})^{1/n} \qquad \text{(L-16)}$$

with

$$t = (\frac{nt_s}{n-1})$$

Sprague[3] reports that C_s typically falls in the range 0.1-0.01 C for t=96 hours, e.g., the incipient toxicity threshold is one tenth to one one-hundredth of the 96 hour LC_{50}. Employing the larger of these values and substituting expression (3) for k_2, expression N-16 can be written as

$$n\ (.1C)\ \left[\frac{(t-t_s)}{(C-0.1C)^n\ (t-t_s)}\right]^{1/n}$$

which reduces to

$$\frac{(n\ 0.1C)}{0.9C} = 0.11\ n \qquad \text{(L-17)}$$

Recalling the simplifying assumption made between equation L-11 and L-12, it is now possible to check how much the dropped term L-16 affects the relationship L-11. This can be done by determining

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[3]Sprague, J. B. "Measurement of Pollutant Toxicity to Fish - III: Sublethal Effects and 'Safe' Concentrations," Water Research, Vol. 5, pp. 245-266, 1971.

the percentage change (at the limits of n) in equation L-11 when expression L-16, substituted as expression L-17, is included. Recalling that n varies between (0 and $-\infty$) one obtains

$$\lim_{n\to o} \frac{[(t-t_s)(1-n-.11n) + t_s] - [(t-t_s)(1-n)+t_s]}{(t-t_s)(1-n) + t_s}$$

$$= \lim_{n\to o} \frac{(t-t_s)(-.11n)}{(t-t_s)(1-n) + t_s} = 0.0$$

and

$$\lim_{n\to-\infty} \frac{(t-t_s)(-.11n)}{(t-t_s)(1-n) + t_s} = 0.11$$

Thus, a maximum variation of 11 percent in equation L-11 occurs as n approaches $-\infty$ and the variation approaches zero as n approaches zero. For almost all of the time-dose curves, the value of n lies between 0 and -1. Thus, the deletion of expression L-16 from equation L-11 remains valid.

The single step remaining is proof that the point with slope 0 is indeed a minimum, and not a maximum. This is done by taking the derivative of the first derivative and determining if it has a positive or negative value. It has been shown that

$$\frac{dHQ}{dc} = -nk_1k_2\ (C-C_s)^{-n-1}\ C + k_1\ k_2\ (C-C_s)^{-h} + k_1\ t_s \qquad \text{(L-18)}$$

and therefore,

$$\frac{d^2HQ}{dc^2} = -n\ k_1\ k_2\ (C-C_s)^{-n-1} + (n+1)(n)k_1\ k_2\ C(C-C_s)^{-n-2} - nk_1\ k_2\ (C-C_s)^{-n-1} \qquad \text{(L-19)}$$

Recalling that n has been found to always be negative and C and C_s must be positive (a negative concentration is impossible) and $C>C_s$ by definition, one needs only determine values for k_1 k_2. From equation L-3, it can be shown that $k_2 > 0$ since the $C-C_s$ and $t-t_s$ terms are positive by definition.

Also,

$k_1 > 0$ by definition of the basic plug flow model in equation (L-1)

Therefore in equation (L-17),

term 1 = $^{-}(n<0)(k_1>0)(k_2>0)\ [(C-C_s)^{-n-1}>0]$ = positive

term 2 = $(n+1)(n<0)(k_1>0)(k_2>0)(C>0)\ [(C-C_s)^{-n-2}>0]$ positive or zero for $n<-1$, negative for $n>-1$, zero for $n=-1$

term 3 = $^{-}(n<0)(k_1>0)(k_2>0)\ [(C-C_s)^{-n}>0]$ = positive

Thus

$\frac{d^2HQ}{dc^2}$ = > 0 for all values of $n<-1$ and the point where

$\frac{dHQ}{dc}$ = 0 is a minimum.

It remains only to evaluate the case where $n > -1$. Since at the same time, $n < 0$ (n is always negative), the absolute value (n) is always less than 1. But terms 1 and 2 of equation L-17 differ only by a factor of $(n+1)/(C-C_s)$. In this expression, the numerator (n+1) by virtue of $-1 < n < 0$ will be a positive decimal and, hence, the first term in equation L-17 is always greater than the second term if $(C-C_s)>1$. In the zone of interest (i.e., $r = t_s$) C approaches infinity, whereas $C_s = 0.1C_{t_{96}}$ is relatively small, and it can be safely assumed that $(C-C_s)$ is always greater than one as $C \to C_{t_s}$. Thus, the second term in equation L-17, though it may be negative, is insufficient in absolute value to override the first term let alone the sum of the first and third terms, and hence, the second derivative is positive; the point where $dHQ/dc = 0$ is a minimum.

APPENDIX M

TABLE OF COST OF PREVENTION ADJUSTMENT FACTORS

Cost of prevention adjustment factors (rk's) which correct the base rate of penalty for toxicity, degradability, and dispersibility have been computed for each hazardous material and are summarized in the following table. These adjustment factors were computed from the following formula:

$$ro = D_1 \times T \times D_2$$

$$rk = \text{adjustment factor} = 1 + 1.41\ ro$$

D_1 = dispersion-solubility term

$$= 1 - \frac{1}{1+\log \frac{\text{Solubility (mg/l)}}{TL_m \text{ (mg/l)}}}$$

T = toxicity factor

$$= 1 - \frac{1}{1+\log \frac{500 \text{ (mg/l)}}{TL_m \text{ (mg/l)}}}$$

D_2 = degradability factor

$$= (1-Deg)$$

where Deg equals the estimated percentage loss of materials in a four day period.

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Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor $r_o = (D_1 \times T \times D_2)$		Adjustment Factor $r_k = 1 + 1.41\ r_o$	
	FW	SW	FW	SW		FW	SW	FW	SW
Acetaldehyde	0.81	0.81	0.51	0.46	0.18	0.07	0.07	1.11	1.11
Acetic acid	0.80	0.82	0.45	0.54	0.33	0.12	0.15	1.17	1.21
Acetic anhydride	0.77	0.78	0.47	0.54	0.33	0.12	0.14	1.17	1.20
Acetone cyanohydrin	0.77	0.77	0.50	0.50	1.00	0.39	0.39	1.55	1.55
Acetyl bromide	0.16	0	0.36	0	0.25	0.01	0	1.02	1.00
Acetyl chloride	0.80	0.76	0.41	0.03	0.25	0.08	0.01	1.11	1.01
Acrolein	0.85	0.89	0.73	0.83	0.96	0.35	0.71	1.49	2.0
Acrylonitrile	0.79	0.78	0.62	0.58	0.53	0.26	0.24	1.37	1.34
Adiponitrile	0.44	0.44	0	0	0.65	0	0	1.00	1.00
Aldrin	0.57 / 0.93	0.51 / 0.88	0.82	0.81	1.00	0.47 / 0.73	0.41 / 0.71	1.66 / 2.00	1.58 / 2.00
Allyl alcohol	0.86	0.84	0.73	0.67	0.92	0.58	0.52	1.82	1.73
Allyl chloride	0.65	0.76	0.52	0.70	0.95	0.32	0.51	1.45	1.72
Aluminum fluoride	0.84	0.77	0.67	0.25	1.00	0.56	0.19	1.80	1.27
Aluminum sulfate	0.76	0.76	0.23	0.23	1.00	0.17	0.17	1.24	1.24
Ammonia	0.82	0.82	0.68	0.68	1.00	0.56	0.56	1.79	1.79
Ammonium acetate	0.78	0.78	0.24	0.24	1.00	0.19	0.19	1.27	1.27
Ammonium benzoate	0.73	0.73	0.06	0.06	1.00	0.04	0.04	1.06	1.06

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor $r_o = (D_1 \times T \times D_2)$		Adjustment Factor $r_k = 1 + 1.41\ r_o$	
	FW	SW	FW	SW		FW	SW	FW	SW
Ammonium bicarbonate	0.79	0.79	0.57	0.57	1.00	0.45	0.45	1.63	1.63
Ammonium bichromate	0.77	0.78	0.36	0.37	1.00	0.28	0.29	1.39	1.41
Ammonium bifluoride	0.75	0.75	0.41	0.41	1.00	0.29	0.29	1.41	1.41
Ammonium bisulfite	0.68	0.68	0.13	0.13	1.00	0.09	0.09	1.13	1.13
Ammonium bromide	0.83	0.83	0.62	0.62	1.00	0.51	0.51	1.72	1.72
Ammonium carbamate	0.82	0.82	0.66	0.66	1.00	0.54	0.54	1.76	1.76
Ammonium carbonate	0.80	0.80	0.54	0.54	1.00	0.43	0.43	1.61	1.61
Ammonium chloride	0.82	0.82	0.66	0.66	1.00	0.54	0.54	1.76	1.76
Ammonium chromate	0.76	0.76	0.24	0.24	1.00	0.18	0.18	1.25	1.25
Ammonium citrate	0.68	0.68	0.13	0.13	1.00	0.09	0.09	1.13	1.13
Ammonium fluoborate	0.80	0.80	0.62	0.62	1.00	0.50	0.50	1.71	1.71
Ammonium fluoride	0.73	0.73	0.28	0.28	1.00	0.20	0.20	1.28	1.28
Ammonium formate	0.79	0.79	0.29	0.29	1.00	0.23	0.23	1.32	1.32
Ammonium hydroxide	0.78	0.78	0.60	0.60	1.00	0.47	0.47	1.66	1.66
Ammonium hypophosphite	0.79	0.79	0.63	0.63	1.00	0.50	0.50	1.71	1.71

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor $r_o = (D_1 \times T \times D_2)$		Adjustment Factor $r_k = 1 + 1.41\ r_o$	
	FW	SW	FW	SW		FW	SW	FW	SW
Ammonium iodide	0.83	0.83	0.60	0.60	1.00	0.50	0.50	1.71	1.71
Ammonium molybdate	0.82	0.82	0.58	0.58	1.00	0.48	0.48	1.68	1.68
Ammonium nitrate	0.83	0.83	0.64	0.64	1.00	0.53	0.53	1.75	1.75
Ammonium oxalate	0.64	0.64	0.05	0.05	1.00	0.03	0.03	1.04	1.04
Ammonium pentaborate	0.76	0.76	0.50	0.50	1.00	0.38	0.38	1.54	1.54
Ammonium persulfate	0.82	0.82	0.56	0.56	1.00	0.46	0.46	1.65	1.65
Ammonium silicofluoride	0.78	0.78	0.50	0.50	1.00	0.39	0.39	1.55	1.55
Ammonium sulfamate	0.79	0.79	0.28	0.28	1.00	0.22	0.22	1.31	1.31
Ammonium sulfate	0.82	0.82	0.60	0.60	1.00	0.49	0.49	1.69	1.69
Ammonium sulfide	0.77	0.77	0.23	0.23	1.00	0.18	0.18	1.25	1.25
Ammonium sulfite	0.76	0.76	0.24	0.24	1.00	0.18	0.18	1.25	1.25
Ammonium tartrate	0.70	0.70	0.20	0.20	1.00	0.14	0.14	1.20	1.20
Ammonium thiocyanate	0.80	0.80	0.39	0.39	1.00	0.31	0.31	1.44	1.44
Ammonium thiosulfate	0.78	0.78	0.22	0.22	1.00	0.17	0.17	1.24	1.24
Amyl acetate	0.52	0.54	0.47	0.49	0.44	0.11	0.12	1.16	1.17
Aniline	0.78	0.78	0.62	0.62	0.47	0.23	0.23	1.32	1.32
Antimony pentachloride	0.83	0.83	0.60	0.60	1.00	0.50	0.50	1.71	1.71

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor $r_o = (D_1 \times T \times D_2)$		Adjustment Factor $r_k = 1 + 1.41\ r_o$	
	FW	SW	FW	SW		FW	SW	FW	SW
Benzene	0.59	0.61	0.55	0.58	0.79	0.35	0.28	1.49	1.39
Benzoic acid	0.52	0.52	0.31	0.31	0.39	0.06	0.06	1.08	1.08
Benzonitrile	0.68	0.68	0.45	0.45	0.47	0.14	0.14	1.20	1.20
Benzoyl chloride	0.52	0.26	0.31	0	0.25	0.04	0	1.06	1.00
Benzyl chloride	0	0	0.33	0	1.00	0	0	1.00	1.00
Beryllium chloride	0.74	0.74	0.37	0.37	1.00	0.27	0.27	1.38	1.38
Beryllium fluoride	0.72	0.76	0.68	0.45	1.00	0.49	0.34	1.69	1.48
Beryllium hydroxide	0	0	0.52	0.52	1.00	0	0	1.00	1.00
Beryllium nitrate	0.79	0.79	0.58	0.58	1.00	0.46	0.46	1.65	1.65
Beryllium sulfate	0.77	0.77	0.25	0.25	1.00	0.19	0.19	1.27	1.27
Brucine	0.62	0.74	0.56	0.71	0.95	0.33	0.50	1.47	1.71
Butyl acetate	0.69	0.71	0.51	0.54	0.49	0.17	0.19	1.24	1.27
Butyl amine	0.82	0.82	0.58	0.58	0.76	0.36	0.36	1.51	1.51
Butyric acid	0.71	0.71	0.28	0.28	0.45	0.09	0.09	1.13	1.13
Cadmium acetate	0.80	0.79	0.63	0.61	1.00	0.50	0.48	1.71	1.68
Cadmium bromide	0.80	0.82	0.65	0.58	1.00	0.52	0.48	1.73	1.68

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Cadmium chloride	0.84	0.83	0.67	0.61	1.00	0.56	0.51	1.79	1.72
Cadmium nitrate	0.84	0.83	0.65	0.59	1.00	0.55	0.49	1.77	1.69
Cadmium sulfate	0.84	0.83	0.66	0.60	1.00	0.55	0.49	1.78	1.69
Calcium arsenate	0.48	0.52	0.60	0.62	1.00	0.29	0.32	1.41	1.45
Calcium arsenite	0.66	0.66	0.49	0.49	1.00	0.32	0.32	1.45	1.45
Calcium carbide	0.53	0.53	0.36	0.36	0.25	0.05	0.05	1.07	1.07
Calcium chromate	0.74	0.73	0.25	0.02	1.00	0.19	0.01	1.27	1.02
Calcium cyanide	0.84	0.84	0.77	0.77	0.50	0.33	0.33	1.47	1.47
Calcium dodecylbenzenesulfonate	0.73	0.75	0.58	0.62	0.62	0.26	0.29	1.37	1.41
Calcium hydroxide	0.52	0.52	0.33	0.33	0.25	0.04	0.04	1.06	1.06
Calcium hypochlorite	0.85	0.82	0.77	0.70	0.25	0.17	0.14	1.23	1.20
Calcium oxide	0.80	0.80	0.38	0.38	0.25	0.08	0.08	1.11	1.11
Captan	0.33 0.87	0.33 0.87	0.76	0.76	0.75	0.19 0.50	0.19 0.50	1.27 1.71	1.27 1.71
Carbon disulfide	0.55	0.55	0.36	0.36	0.95	0.19	0.19	1.27	1.27
Catechol	0.82	0.82	0.61	0.61	0.68	0.34	0.34	1.48	1.48
Chlordane	0.40 0.88	0.45 0.89	0.81	0.82	0.30	0.10 0.21	0.11 0.22	1.14 1.30	1.16 1.31
Chlorine	0.84	0.81	0.79	0.73	0.25	0.17	0.15	1.23	1.17

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor $r_o = (D_1 \times T \times D_2)$		Adjustment Factor $r_k = 1 + 1.41\ r_c$	
	FW	SW	FW	SW		FW	SW	FW	SW
Chlorobenzene	0.58	0.58	0.58	0.58	0.99	0.33	0.33	1.47	1.47
Chloroform	0.47	0.47	0.38	0.38	0.98	0.29	0.29	1.41	1.41
Chlorosulfonic acid	0.80	0.77	0.45	0.14	0.25	0.09	0.03	1.13	1.04
Chromic acetate	0.80	0.77	0.66	0.59	1.00	0.53	0.45	1.75	1.63
Chromic acid	0.82	0.80	0.54	0.41	1.00	0.44	0.33	1.62	1.47
Chromic sulfate	0.79	0.77	0.64	0.57	1.00	0.51	0.44	1.72	1.62
Chromous carbonate	0.69	0.64	0.69	0.64	1.00	0.48	0.41	1.68	1.58
Chromous chloride	0.82	0.80	0.69	0.64	1.00	0.57	0.51	1.80	1.72
Chromous oxalate	0.80	0.78	0.68	0.62	1.00	0.54	0.48	1.76	1.68
Chromyl chloride	0.81	0.79	0.50	0.34	1.00	0.69	0.73	1.97	2.00
Cobaltous acetate	0.70-0.77	0.52-0.67	0.52	0	1.00	0.36-0.40	0	1.51-1.56	1.00
Cobaltous bromide	0.81	0.76	0.53	0	1.00	0.43	0	1.61	1.00
Cobaltous chloride	0.80	0.73	0.52	0	1.00	0.42	0	1.59	1.00
Cobaltous citrate	0.76	0.65	0.54	0	1.00	0.41	0	1.58	1.00
Cobaltous fluoride	0.77	0.67	0.57	0.04	1.00	0.44	0.03	1.62	1.04
Cobaltous formate	0.76	0.66	0.55	0	1.00	0.42	0	1.59	1.00

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor $r_o = (D_1 \times T \times D_2)$		Adjustment Factor $r_k = 1 + 1.41\ r_o$	
	FW	SW	FW	SW		FW	SW	FW	SW
Cobaltous iodide	0.82	0.76	0.49	0	1.00	0.40	0	1.57	1.00
Cobaltous nitrate	0.81	0.75	0.50	0	1.00	0.41	0	1.58	1.00
Cobaltous perchlorate	1.81	0.74	0.48	0	1.00	0.36	0	1.51	1.00
Cobaltous succinate	0.60	0.18	0.55	0	1.00	0.39	0	1.55	1.00
Cobaltous sulfamate	0.68	0.44	0.52	0	1.00	0.35	0	1.50	1.00
Cobaltous sulfate	0.79	0.72	0.50	0	1.00	0.40	0	1.56	1.00
Coumaphos	0.48 / 0.87	0.53 / 0.87	0.77	0.79	0.75	0.28 / 0.50	0.31 / 0.52	1.39 / 1.71	1.44 / 1.73
Creosol	0.77	0.72	0.63	0.49	0.67	0.33	0.24	1.47	1.34
Cupric acetate	0.77	0.80	0.56	0.66	1.00	0.43	0.53	1.61	1.75
Cupric acetoarsenite	0.73	0.68	0.71	0.64	1.00	0.52	0.44	1.73	1.62
Cupric acetylacetonate	0.75	0.70	0.73	0.67	1.00	0.55	0.47	1.78	1.66
Cupric bromide	0.83	0.81	0.72	0.65	1.00	0.60	0.53	1.85	1.75
Cupric chloride	0.85	0.84	0.73	0.67	1.00	0.62	0.56	1.87	1.79
Cupric formate	0.84	0.81	0.73	0.67	1.00	0.61	0.54	1.86	1.76
Cupric gluconate	0.83	0.81	0.69	0.61	1.00	0.57	0.49	1.81	1.70

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Cupric glycinate	0.77	0.74	0.71	0.65	1.00	0.55	0.48	1.78	1.68
Cupric lactate	0.83	0.81	0.71	0.65	1.00	0.59	0.53	1.83	1.75
Cupric nitrate	0.85	0.83	0.71	0.64	1.00	0.60	0.53	1.85	1.75
Cupric oxalate	0.58	0.42	0.73	0.67	1.00	0.42	0.28	1.59	1.39
Cupric subacetate	0.78	0.75	0.73	0.66	1.00	0.56	0.50	1.79	1.71
Cupric sulfate	0.82	0.82	0.64	0.65	1.00	0.52	0.53	1.73	1.75
Cupric sulfate ammoniated	0.84	0.83	0.71	0.65	1.00	0.60	0.54	1.85	1.76
Cupric tartrate	0.67	0.57	0.71	0.63	1.00	0.48	0.36	1.68	1.51
Cuprous bromide	0.73	0.67	0.73	0.67	1.00	0.53	0.45	1.75	1.63
Cuprous iodide	0.44	0.13	0.72	0.66	1.00	0.32	0.09	1.45	1.13
Cyanogen chloride	0.82	0.82	0.79	0.79	0.50	0.32	0.32	1.46	1.46
Cyclohexane	0.14	0.14	0.55	0.55	0.20	0.02	0.02	1.03	1.03
2,4-D (acid)		0.67 / 0.84	0.13 / 0.64		0.66	0.50		0.22 / 0.28	1.31 / 1.39
2,4-D (esters)			0.71	0.64	0.50				
Dalapon	0.79	0.85	0.40	0.73	0.75	0.24	0.47	1.34	1.66
DDT	0.08 / 0.89	0 / 0.88	0.83	0.81	1.00	0.07 / 0.74	0 / 0.71	1.10 / 2.00	1.08 / 2.00
Diazinon	0.77 / 0.88	0.77 / 0.88	0.81	0.81	0.80	0.50 / 0.71	0.50 / 0.71	1.70 / 2.00	1.70 / 2.00

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Dicamba	0.67	0.67	0.52	0.52	1.00	0.35	0.35	1.49	1.49
Dichlobenil	0.88 / 0.82	0.88 / 0.83	0.61	0.61	1.00	0.05 / 0.48	0.05 / 0.53	1.07 / 1.68	1.07 / 1.75
Dichlone	0.28 / 0.88	0.28 / 0.86	0.80	0.80	1.00	0.22 / 0.70	0.22 / 0.65	1.31 / 1.99	1.31 / 1.92
Dichlorvos	0.81	0.81	0.74	0.74	1.00	0.60	0.60	1.85	1.85
Dieldrin	0.58 / 0.89	0.36 / 0.88	0.83	0.80	1.00	0.48 / 0.74	0.29 / 0.70	1.68 / 2.00	1.41 / 1.99
Diethylamine	0.80	0.80	0.43	0.43	0.91	0.31	0.31	1.44	1.44
Dimethylamine	0.75	0.75	0.43	0.41	0.95	0.31	0.29	1.44	1.41
Dinitrophenol	0.72	0.72	0.54	0.54	0.65	0.25	0.25	1.35	1.35
Diquat	0.81	0.79	0.54	0.63	0.85	0.37	0.42	1.52	1.60
Disulfoton	0.74 / 0.88	0.74 / 0.88	0.80	0.80	0.85	0.50 / 0.60	0.50 / 0.60	1.71 / 1.85	1.71 / 1.85
Diuron	0.51 / 0.84	0.58 / 0.85	0.68	0.71	0.95	0.33 / 0.54	0.39 / 0.57	1.47 / 1.76	1.55 / 1.80
Dodecylbenzenesulfonic acid	0.77	0.79	0.59	0.64	0.62	0.28	0.31	1.39	1.44
Dursban	0.63 / 0.88	0.63 / 0.88	0.80	0.80	0.85	0.43 / 0.60	0.43 / 0.60	1.61 / 1.85	1.61 / 1.85
Endosulfan	0.71 / 0.90	0.67 / 0.89	0.85	0.82	0.85	0.51 / 0.65	0.47 / 0.62	1.72 / 1.92	1.66 / 1.87
Endrin	0.72 / 0.90	0.65 / 0.89	0.86	0.84	0.50	0.31 / 0.39	0.34 / 0.38	1.44 / 1.55	1.48 / 1.54
Ethion	0.47 / 0.87	0.47 / 0.87	0.78	0.78	0.85	0.31 / 0.58	0.31 / 0.58	1.44 / 1.82	1.44 / 1.82

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Ethylbenzene	0	0	0.55	0.55	0.97	0	0	1.00	1.00
Ethylenediamine	0.82	0.83	0.55	0.51	0.79	0.36	0.40	1.51	1.56
EDTA	0	0	0	0	0.99	0	0	1.00	1.00
Ferric ammonium citrate	0.82	0.81	0.56	0.50	1.00	0.46	0.41	1.65	1.57
Ferric chloride	0.77	0.75	0.58	0.53	1.00	0.45	0.40	1.63	1.56
Ferric fluoride	0.72	0.69	0.61	0.56	1.00	0.44	0.39	1.62	1.54
Ferric nitrate	0.76	0.74	0.55	0.48	1.00	0.42	0.36	1.59	1.50
Ferric phosphate	0.60	0.56	0.60	0.56	1.00	0.36	0.31	1.51	1.44
Ferric sulfate	0.84	0.84	0.58	0.52	1.00	0.49	0.44	1.69	1.62
Ferrous ammonium sulfate	0.80	0.79	0.58	0.52	1.00	0.46	0.41	1.65	1.58
Ferrous chloride	0.83	0.83	0.58	0.52	1.00	0.48	0.43	1.68	1.61
Ferrous oxalate	0.55	0.48	0.61	0.56	1.00	0.34	0.27	1.48	1.38
Ferrous sulfate	0.81	0.77	0.58	0.52	1.00	0.47	0.40	1.66	1.56
Formaldehyde	0.82	0.79	0.57	0.27	0.13	0.06	0.03	1.08	1.04
Formic acid	0.79	0.80	0.31	0.43	0.58	0.14	0.20	1.20	1.28

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Fumaric acid	0.63	0.63	0.36	0.36	0.31	0.07	0.07	1.10	1.10
Furfural	0.78	0.78	0.57	0.57	0.72	0.32	0.32	1.45	1.45
Guthion	0.75 / 0.88	0.79 / 0.89	0.81	0.83	0.80	0.49 / 0.57	0.52 / 0.59	1.69 / 1.80	1.73 / 1.83
Heptachlor	0.32 / 0.89	0 / 0.86	0.82	0.74	1.00	0.26 / 0.73	0 / 0.64	1.37 / 2.00	1.00 / 1.90
Hydrochloric acid	0.81	0.78	0.51	0.27	0.25	0.10	0.05	1.14	1.07
Hydrofluoric acid	0.85	0.80	0.69	0.38	0.25	0.19	0.08	1.17	1.21
Hydrogen cyanide	0.84	0.85	0.77	0.79	0.50	0.33	0.34	1.46	1.47
Hydroquinone	0.80	0.80	0.67	0.67	0.53	0.28	0.28	1.39	1.39
Hydroxylamine	0.74	0.74	0.34	0.34	0.75	0.19	0.19	1.27	1.27
Isoprene	0.11	0.11	0.45	0.45	0.90	0.04	0.04	1.06	1.06
Isopropanolamine dodecylbenzene-sulfonate	0.79	0.80	0.58	0.62	0.62	0.28	0.31	1.39	1.44
Kelthane	0.41 / 0.80	0.41 / 0.80	0.41	0.41	1.00	0.17 / 0.33	0.17 / 0.33	0.24 / 1.46	1.24 / 1.46
Lead acetate	0.78	0.74	0.37	0.06	1.00	0.29	0.04	1.41	1.06
Lead bromide	0.61	0.51	0.37	0.07	1.00	0.23	0.04	1.32	1.06
Lead chloride	0.57	0.40	0.05	0.17	1.00	0.03	0.07	1.04	1.10
Lead fluoborate	0.80	0.70	0.37	0.06	1.00	0.30	0.04	1.42	1.06

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Lead fluoride	0.60	0.27	0.59	0.20	1.00	0.35	0.05	1.50	1.07
Lead iodide	0.32	0	0.34	0	1.00	0.11	0	1.15	1.00
Lead nitrate	0.82	0	0.39	0	1.00	0.32	0	1.45	1.00
Lead stearate	0	0	0.23	0	1.00	0	0	1.00	1.00
Lead sulfate	0.38	0.09	0.31	0.14	1.00	0.12	0.01	1.17	1.01
Lead sulfide	0	0	0.44	0.21	1.00	0	0	1.00	1.00
Lead tetraacetate	0	0	0.35	0	1.00	0	0	1.00	1.00
Lead thiocyanate	0.40	0.12	0.40	0.12	1.00	0.16	0.01	1.23	1.01
Lead thiosulfate	0.31	0	0.40	0.12	1.00	0.12	0	1.17	1.00
Lead tungstate	0.23	0	0.34	0	1.00	0.08	0	1.11	1.00
Lindane	0.68 / 0.88	0.59 / 0.87	0.79	0.76	1.00	0.54 / 0.70	0.45 / 0.66	1.76 / 1.99	1.63 / 1.93
Lithium bichromate	0.79	0.79	0.30	0.37	1.00	0.24	0.29	1.34	1.41
Lithium chromate	0.79	0.79	0.35	0.32	1.00	0.28	0.25	1.39	1.35
Lithium fluoride	0.74	0.54	0.68	0.30	1.00	0.50	0.16	1.71	1.23
Malathion	0.76 / 0.87	0.78 / 0.88	0.78	0.81	0.90	0.53 / 0.61	0.57 / 0.64	1.75 / 1.86	1.80 / 1.90
Maleic acid	0.74	0.74	0.36	0.36	0.33	0.09	0.09	1.13	1.13
Maleic anhydride	0.76	0.76	0.39	0.39	0.33	0.10	0.10	1.14	1.14

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Mercuric acetate	0.85	0.85	0.75	0.76	1.00	0.64	0.65	1.90	1.92
Mercuric chloride	0.83	0.84	0.76	0.76	1.00	0.63	0.64	1.89	1.90
Mercuric nitrate	0.84	0.85	0.75	0.76	1.00	0.63	0.65	1.89	1.92
Mercuric oxide	0.69	0.70	0.76	0.77	1.00	0.52	0.54	1.73	1.76
Mercuric sulfate	0.26	0.34	0.75	0.69	1.00	0.20	0.23	1.27	1.33
Mercuric thiocyanate	0.76	0.77	0.75	0.76	1.00	0.57	0.59	1.80	1.83
Mercurous nitrate	0	0	0.75	0.76	1.00	0	0	1.00	1.00
Methoxychlor	0.17 / 0.88	0.09 / 0.88	0.80	0.79	1.00	0.14 / 0.70	0.07 / 0.70	1.20 / 1.99	1.10 / 1.99
Methyl mercaptan	0.81	0.81	0.73	0.73	0.90	0.52	0.52	1.73	1.73
Methyl methacrylate	0.38	0.38	0.23	0.23	0.59	0.05	0.05	1.07	1.07
Methyl parathion	0.45 / 0.84	0.81 / 0.89	0.66	0.84	0.50	0.15 / 0.28	0.34 / 0.37	1.21 / 1.39	1.48 / 1.53
Mevinphos	0.88	0.88	0.81	0.80	0.45	0.71	0.32	2.00	1.45
Molybdic trioxide	0.53	0.53	0.12	0.12	1.00	0.06	0.06	1.08	1.08
Monoethylamine	0.81	0.81	0.52	0.52	0.85	0.36	0.36	1.51	1.51
Monomethylamine	0.78	0.78	0.55	0.55	0.82	0.35	0.35	1.49	1.49
Naled	0.77	0.77	0.77	0.77	0.50	0.30	0.30	1.42	1.42

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Naphthalene	0.47	0.55	0.68	0.71	1.00	0.32	0.39	1.45	1.55
Naphthenic acid	0.71	0.71	0.65	0.65	1.00	0.46	0.46	1.65	1.65
Nickel acetate	0.76	0.71	0.39	0	1.00	0.30	0	1.42	1.00
Nickel ammonium sulfate	0.70	0.62	0.37	0	1.00	0.26	0	1.37	1.00
Nickel bromide	0.80	0.76	0.38	0	1.00	0.30	0	1.42	1.00
Nickel chloride	0.79	0.76	0.40	0	1.00	0.32	0	1.45	1.00
Nickel formate	0.75	0.71	0.43	0.10	1.00	0.32	0.07	1.45	1.10
Nickel hydroxide	0	0	0.52	0.29	1.00	0	0	1.00	1.00
Nickel nitrate	0.85	0.76	0.72	0	1.00	0.61	0	1.86	1.00
Nickel sulfate	0.79	0.76	0.38	0	1.00	0.30	0	1.42	1.00
Nitric acid	0.80	0.79	0.44	0.27	0.25	0.09	0.05	1.12	1.07
Nitrobenzene	0.52	0.52	0.34	0.34	1.00	0.18	0.18	1.25	1.25
Nitrogen dioxide	0.80	0.79	0.46	0.27	0.25	0.09	0.05	1.13	1.07
Nitrophenol	0.71	0.71	0.51	0.51	1.00	0.36	0.36	1.51	1.51
Paraformaldehyde	0.79	0.74	0.57	0.27	0.61	0.27	0.12	1.38	1.17
Parathion	0.59 / 0.88	0.78 / 0.89	0.74	0.83	0.95	0.44 / 0.67	0.62 / 0.70	1.62 / 1.94	1.87 / 1.99

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Pentachlorophenol	0.55	0.71	0.67	0.77	1.00	0.37	0.55	1.52	1.78
Phenol	0.79	0.78	0.62	0.57	0.40	0.20	0.18	1.28	1.25
Phosgene	0.81	0.78	0.48	0.49	0.25	0.10	0.04	1.14	1.05
Phosphoric acid	0.75	0.75	0.28	0	0.25	0.06	0	1.08	1.00
Phosphorus	0.64	0.75	0.80	0.84	0.75	0.39	0.48	1.55	1.68
Phosphorus oxychloride	0.80	0.78	0.45	0.13	0.25	0.09	0.03	1.13	1.04
Phosphorus pentafluoride	0.82	0.79	0.54	0.33	0.25	0.11	0.07	1.16	1.09
Phosphorus pentasulfide	0.81	0.82	0.49	0.54	0.25	0.10	0.11	1.14	1.16
Phosphorus trichloride	0.81	0.78	0.48	0.21	0.25	0.10	0.04	1.14	1.06
Polychlorinated biphenyls	0.03-0.56	0	0.76	0.77	1.00	0.02-0.43	0	1.03-1.61	1.00
Potassium arsenate	0.81	0.81	0.61	0.61	1.00	0.49	0.49	1.69	1.69
Potassium arsenite	0.77	0.77	0.56	0.56	1.00	0.43	0.43	1.61	1.61
Potassium bichromate	0.72	0.72	0.37	0.35	1.00	0.27	0.25	1.38	1.35
Potassium chromate	0.78	0.78	0.32	0.29	1.0	0.25	0.23	1.35	1.32
Potassium cyanide	0.86	0.86	0.75	0.75	0.50	0.33	0.33	1.47	1.47

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Potassium hydroxide	0.80	0.81	0.44	0.51	0.25	0.09	0.10	1.12	1.14
Potassium permanganate	0.81	0.82	0.67	0.70	0.75	0.41	0.43	1.58	1.61
Propionic acid	0.79	0.79	0.30	0.30	0.65	0.16	0.16	1.23	1.23
Propionic anhydride	0.79	0.79	0.33	0.33	0.65	0.17	0.17	1.24	1.24
Propyl alcohol	0.78	0.70	0.13	0	0.44	0.04	0	1.06	1.00
Pyrethrins	0 / 0.81	0 / 0.81	0.45	0.45	0.85	0 / 0.31	0 / 0.31	1.00 / 1.44	1.00 / 1.44
Pyrogallic acid	0.82	0.82	0.59	0.59	0.99	0.48	0.48	1.68	1.68
Quinoline	0.80	0.80	0.67	0.67	0.56	0.30	0.30	1.42	1.42
Resorcinol	0.82	0.82	0.54	0.54	0.46	0.20	0.20	1.29	1.29
Selenic acid	0.78	0.78	0.56	0.56	1.00	0.44	0.44	1.62	1.62
Selenium oxide	0.82	0.82	0.62	0.62	1.00	0.51	0.51	1.72	1.72
Sevin	0.68 / 0.84	0.72 / 0.85	0.65	0.69	0.45	0.20 / 0.25	0.22 / 0.26	1.28 / 1.35	1.31 / 1.37
Sodium	0.79	0.80	0.49	0.53	0.25	0.10	0.11	1.14	1.15
Sodium arsenate	0.81	0.81	0.56	0.56	1.00	0.45	0.45	1.63	1.63
Sodium arsenite	0.78	0.78	0.56	0.56	1.00	0.44	0.44	1.62	1.62
Sodium bichromate	0.79	0.79	0.27	0.34	1.00	0.21	0.27	1.30	1.38

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Sodium bifluoride	0.79	0.69	0.67	0.26	1.00	0.53	0.18	1.75	1.25
Sodium bisulfite	0.76	0.76	0.24	0.24	1.00	0.18	0.18	1.25	1.25
Sodium chromate	0.73	0.72	0.18	0.14	1.00	0.12	0.10	1.17	1.14
Sodium cyanide	0.87	0.87	0.78	0.77	0.50	0.34	0.34	1.48	1.47
Sodium dodecylbenzenesulfonate	0.77	0.79	0.59	0.63	0.62	0.28	0.31	1.39	1.44
Sodium fluoride	0.79	0.68	0.65	0.18	1.00	0.51	0.12	1.72	1.17
Sodium hydrosulfide	0.8	0.8	0.63	0.63	1.00	0.50	0.50	1.71	1.71
Sodium hydroxide	0.78	0.79	0.41	0.47	0.25	0.12	0.09	1.16	1.13
Sodium hypochlorite	0.87	0.85	0.77	0.70	0.25	0.17	0.15	1.24	1.21
Sodium methylate	0.78	0.79	0.36	0.43	1.00	0.28	0.34	1.40	1.48
Sodium nitrite	0.83	0.83	0.65	0.65	1.00	0.54	0.54	1.76	1.76
Sodium phosphate (mono-basic)	0.74	0.74	0	0	1.00	0	0	1.00	1.00
Sodium phosphate (di-basic)	0.77	0.77	0.07	0.07	1.00	0.05	0.05	1.07	1.07
Sodium phosphate (tri-basic)	0.67	0.67	0.34	0.34	1.00	0.23	0.23	1.32	1.32
Sodium selenite	0.77	0.77	0.49	0.49	1.00	0.38	0.38	1.54	1.54
Sodium sulfide	0.80	0.80	0.48	0.48	1.00	0.38	0.38	1.54	1.54

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	PU	SW	PU	SW		PU	SW	PU	SW
Strontium chromate	0.45	0.43	0.31	0.28	1.00	0.14	0.12	1.20	1.17
Strychnine	0.63	0.66	0.56	0.71	0.85	0.20	0.40	1.28	1.56
Styrene	0.54	0.44	0.58	0.58	0.43	0.13	0.09	1.18	1.13
Sulfuric acid	0.80	0.79	0.38	0.27	0.25	0.08	0.05	1.11	1.07
Sulfur monochloride	0.80	0.77	0.43	0.09	0.25	0.09	0.02	1.12	1.02
2,4,5-T (acid)	0.52 / 0.83	0.75 / 0.87	0.62	0.78	0.56	0.18 / 0.29	0.33 / 0.38	1.25 / 1.41	1.47 / 1.54
2,4,5-T (esters)	0.48 / 0.8	0.48 / 0.83	0.59	0.59	0.65	0.18 / 0.32	0.18 / 0.32	1.25 / 1.45	1.25 / 1.45
Tannic acid	0.82	0.82	0.53	0.53	0.96	0.42	0.42	1.59	1.59
TDE	0.77 / 0.88	0.77 / 0.88	0.80	0.80	1.00	0.62 / 0.70	0.62 / 0.70	1.87 / 1.99	1.87 / 1.99
Tetraethyl lead	0.69	0.69	0.77	0.77	1.00	0.53	0.53	1.75	1.75
Tetraethyl pyrophosphate	0.86	0.86	0.74	0.74	0.25	0.16	0.16	1.23	1.23
Toluene	0.56	0.54	0.57	0.54	0.75	0.24	0.16	1.34	1.23
Toxaphene	0.72 / 0.89	0.60 / 0.88	0.84	0.80	1.00	0.60 / 0.73	0.48 / 0.70	1.85 / 2.00	1.68 / 1.99
Trichlorfon	0.74	0.74	0.31	0.31	1.00	0.23	0.23	1.32	1.32
Trichlorophenol	0.80	0.80	0.79	0.79	0.80	0.51	0.51	1.72	1.72
Triethanolamine dodecylbenzene-sulfonate	0.79	0.80	0.58	0.61	0.62	0.28	0.30	1.39	1.42

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor $r_o = (D_1 \times T \times D_2)$		Adjustment Factor $r_k = 1 + 1.41\ r_o$	
	FW	SW	FW	SW		FW	SW	FW	SW
Triethylamine	0.80	0.80	0.44	0.44	0.74	0.26	0.26	1.37	1.37
Trimethylamine	0.79	0.79	0.05	0.05	0.74	0.40	0.40	1.56	1.56
Uranium peroxide	0	0	0.48	0.48	1.00	0	0	1.00	1.00
Uranyl acetate	0.72	0.72	0.31	0.31	1.00	0.22	0.72	1.31	1.31
Uranyl nitrate	0.79	0.79	0.34	0.34	1.00	0.27	0.27	1.38	1.38
Uranyl sulfate	0.76	0.76	0.36	0.36	1.00	0.27	0.27	1.39	1.39
Vanadium oxytrichloride	0.42	0.42	0.42	0.42	1.00	0.18	0.18	1.25	1.25
Vanadium pentoxide	0.68	0.68	0.49	0.49	1.00	0.33	0.33	1.47	1.47
Vanadyl sulfate	0.75	0.75	0.49	0.49	1.00	0.37	0.37	1.52	1.52
Vinyl acetate	0.75	0.72	0.59	0.50	0.69	0.30	0.25	1.42	1.35
Xylene	0.58	0.55	0.58	0.55	1.00	0.34	0.02	1.48	1.03
Xylenol	0.68	0.68	0.53	0.53	0.73	0.26	0.26	1.37	1.37
Zectran	0.49 / 0.83	0.49 / 0.83	0.62	0.62	0.85	0.26 / 0.44	0.26 / 0.44	1.36 / 1.62	1.36 / 1.62
Zinc acetate	0.79	0.80	0.52	0.54	1.00	0.41	0.43	1.58	1.61
Zinc ammonium chloride	0	0	0.54	0.57	1.00	0	0	1.00	1.00
Zinc bichromate	0.56	0.58	0.49	0.52	1.00	0.27	0.30	1.38	1.42

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Zinc borate	0.77	0.77	0.57	0.59	1.00	0.44	0.45	1.62	1.63
Zinc bromide	0.83	0.82	0.62	0.54	1.00	0.51	0.44	1.72	1.62
Zinc carbonate	0	0	0.57	0.59	1.00	0	0	1.00	1.00
Zinc chloride	0.84	0.82	0.56	0.58	1.00	0.47	0.48	1.66	1.68
Zinc cyanide	0.59	0.57	0.77	0.73	1.00	0.45	0.42	1.63	1.59
Zinc fluoride	0.74	0.75	0.61	0.56	1.00	0.45	0.42	1.64	1.59
Zinc formate	0.76	0.77	0.55	0.57	1.00	0.42	0.44	1.59	1.62
Zinc hydrosulfite	0.76	0.76	0.53	0.55	1.00	0.40	0.42	1.56	1.59
Zinc nitrate	0.81	0.81	0.49	0.52	1.00	0.40	0.42	1.56	1.59
Zinc permanganate	0.76	0.76	0.44	0.48	1.00	0.33	0.36	1.47	1.51
Zinc phenolsulfonate	0.79	0.80	0.40	0.44	1.00	0.32	0.35	1.45	1.49
Zinc phosphide	0.59	0.61	0.59	0.61	1.00	0.35	0.37	1.49	1.52
Zinc potassium chromate	0.46	0.49	0.46	0.49	1.00	0.21	0.24	1.30	1.34
Zinc propionate	0.76	0.76	0.52	0.55	1.00	0.40	0.42	1.56	1.59
Zinc silicofluoride	0.76	0.77	0.48	0.51	1.00	0.36	0.39	1.51	1.55

Hazardous Material	Dispersion-Solubility Factor (D_1)		Toxicity Factor (T)		Degradability Factor (D_2)	Adjustment Factor ro = (D_1 x T x D_2)		Adjustment Factor rk = 1 + 1.41 ro	
	FW	SW	FW	SW		FW	SW	FW	SW
Zinc sulfate	0.81	0.81	0.52	0.53	1.00	0.42	0.43	1.59	1.61
Zirconium acetate	0.69	0.69	0.17	0.17	1.00	0.12	0.12	1.17	1.17
Zirconium nitrate	0.66	0.60	0	0	1.00	0	0	1.00	1.00
Zirconium oxychloride	0.63	0.63	0	0	1.00	0	0	1.00	1.00
Zirconium potassium fluoride	0.79	0.69	0.65	0.20	1.00	0.51	0.14	1.72	1.19
Zirconium sulfate	0.75	0.75	0.04	0.04	1.00	0.03	0.03	1.04	1.04
Zirconium tetrachloride	0.72	0.65	0.35	0	1.00	0.25	0	1.35	1.00

APPENDIX N

FINAL HARMFUL QUANTITIES AND RATES OF PENALTY

Final harmful quantities and rates of penalty for the various methodologies have been computed and are given in Tables N-1 through N-4. This format of presentation was selected to facilitate comparison of the numbers derived from the different methodologies. The values are given in scientific notation. An entry such as 5.4E02 is equivalent to 5.4×10^2 or 540. The top entry is in metric units, the bottom in English. The KG/LB and LTR/GAL notations differentiate between solid and liquid species.

TABLE N-1

SUMMARY OF HARMFUL QUANTITIES
AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOMSI (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ACETALDEHYDE	2.3E 03 5.1E 03	4.1E 03 9.0E 03	5.9E 03 8.7E 03	2.1E 03 LTN 5.5E 02 GAL	9.9E 02 2.5E 03	1.3E 01 2.9E 02	8.3E-01 6.2E-01	1.7E+01 1.7E+01	1.0E+01 2.3E+02	1.1E+01 LTN 8.1E+01 GAL
ACETIC ACID	1.1E 03 2.5E 03	4.1E 03 9.0E 03	5.0E 03 1.2E 04	2.1E 03 LTN 5.5E 02 GAL	1.2E 01 2.7E 02	1.0E 01 2.3E 02	9.8E-01 6.5E-01	4.1E+01 2.4E-01	9.9E-02 4.5E-02	1.8E+01 LTN 4.0E+01 GAL
ACETIC ANHYDRIDE	2.0E 03 4.5E 03	4.1E 03 9.0E 03	4.9E 03 1.1E 04	2.1E 03 LTN 5.5E 02 GAL	1.3E 01 2.7E 02	1.4E 01 3.2E 02	9.7E-01 6.4E-01	6.1E-01 2.8E-01	9.8E-02 4.4E-02	1.8E+01 LTN 4.0E+01 GAL
ACETONE CYANOHYDRIN	2.2E 03 4.9E 03	4.1E 03 9.0E 03	3.7E 03 8.2E 03	2.1E 03 LTN 5.5E 02 GAL	1.6E 01 3.2E 02	1.4E 01 3.1E 02	1.3E 00 5.9E-01	1.1E 00 5.1E+01	1.3E-01 5.8E-02	1.9E-01 LTN 1.3E 00 GAL
ACETYL BROMIDE	4.5E 03 1.0E 04	2.2E 04 4.9E 04	1.1E 04 2.5E 04	1.5E 04 LTN 4.0E 03 GAL	8.7E 02 2.1E 03	1.2E 01 5.3E 01	8.6E-01 5.9E-01	9.2E-02 4.1E-02	1.3E-02 2.9E-02	2.6E-02 LTN 1.8E+01 GAL
ACETYL CHLORIDE	4.4E 03 9.7E 03	2.2E 04 4.9E 04	7.4E 03 1.6E 04	1.5E 04 LTN 4.0E 03 GAL	9.8E 02 2.5E 03	1.3E 01 5.9E 01	9.3E-01 6.2E-01	1.1E-01 5.1E-02	1.3E-02 2.8E-02	5.3E-02 LTN 1.2E+01 GAL
ACROLEIN	1.0E 01 2.3E 01	5.7E 01 1.2E 02	4.5E 01 1.0E 02	1.9E 01 LTN 5.7E 00 GA	1.3E 01 2.8E 02	1.9E 01 4.2E 01	1.3E 00 5.7E-01	6.8E 01 1.8E 01	7.4E 00 3.3E 00	1.7E 01 LTN 6.7E 01 GA
ACRYLONITRILE	5.0E 02 1.1E 03	4.1E 03 9.0E 03	8.9E 02 1.9E 03	2.1E 03 LTN 5.5E 02 GAL	1.0E 01 2.3E 02	1.0E 01 2.3E 02	1.2E 00 5.2E-01	7.1E-01 3.3E-01	2.4E-01 2.5E-01	2.2E+01 LTN 8.2E+01 GAL
ADIPONITRILE	3.6E 03 7.9E 03	2.2E 04 4.9E 04	6.1E 03 1.3E 04	1.5E 04 LTN 4.0E 03 GAL	8.4E 02 2.0E 03	1.2E 01 5.3E 01	8.3E-01 5.8E-01	9.7E-02 4.1E-02	7.4E-03 3.5E-03	2.0E-02 LTN 1.0E+01 GAL
ALCOHOL (PURE)	5.7E-01 1.3E 00	3.7E 01 8.2E 01	9.7E-01 2.1E 00	2.3E 01 KG 5.1E 01 LB	1.5E 01 3.3E 02	2.7E 01 6.0E 01	1.4E 00 6.3E-01	1.5E 02 6.7E 01	7.6E 02 3.5E 02	6.5E 01 KG 2.7E 01 LB
ALCOHOL (PORTABLE)	5.7E-01 1.3E 00	3.7E 01 8.2E 01	9.7E-01 2.1E 00	2.3E 01 KG 5.1E 01 LB	1.0E 01 2.3E 02	2.4E 01 1.1E 01	1.7E 00 7.6E-01	2.4E 02 1.1E 02	1.1E 03 8.9E 02	7.2E 01 KG 9.5E 01 LB
ALLYL ALCOHOL	5.0E 01 1.1E 02	3.7E 01 8.2E 01	9.5E 01 2.1E 02	1.9E 01 LTN 5.2E 00 GAL	1.0E 01 2.3E 02	2.1E 01 9.7E 00	1.5E 00 6.9E-01	8.5E 01 1.6E 01	7.2E 00 3.3E 00	1.7E 01 LTN 6.7E 01 GAL
ALLYL CHLORIDE	1.0E 03 2.2E 03	4.1E 03 9.0E 03	1.1E 03 2.4E 03	2.1E 03 LTN 5.5E 02 GAL	1.3E 01 2.8E 02	1.7E 01 7.6E 01	1.2E 00 5.5E-01	6.1E-01 2.8E-01	5.5E-02 2.5E-02	1.9E-01 LTN 8.8E+01 GAL
ALUMINUM FLUORIDE	2.2E 02 4.9E 02	4.1E 02 9.0E 02	1.9E 02 7.4E 02	2.3E 02 KG 5.0E 02 LB	1.1E 01 2.4E 02	1.9E 01 4.2E 01	1.1E 00 6.0E-01	1.2E 01 5.5E-01	1.2E 00 5.3E-01	3.1E 00 KG 1.4E 00 LB
ALUMINUM SULFATE	1.1E 04 2.4E 04	2.2E 04 4.9E 04	1.9E 04 4.1E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 02	1.5E 01 6.6E 00	1.2E 00 6.7E-01	1.9E+01 8.7E-02	2.2E+04 9.8E-03	5.0E+02 KG 2.5E+02 LB

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SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIA	1.5E 02 3.3E 02	4.1E 02 9.1E 02	2.5E 02 5.6E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.2E 01	2.1E 01 9.6E 02	1.5E 00 6.8E-01	3.7E 00 1.7E 02	1.9E 00 8.5E-01	1.1E 00 KG 4.9E-01 LB
AMMONIUM ACETATE	1.2E 04 2.7E 04	2.2E 04 4.9E 04	1.8E 04 3.9E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 02	1.5E 01 6.8E 02	1.1E 00 4.8E-01	1.1E-01 5.1E-02	2.6E-02 1.2E-02	3.3E-02 KG 1.5E-02 LB
AMMONIUM BENZOATE	1.9E 04 4.2E 04	2.6E 04 5.9E 04	3.2E 04 7.0E 04	1.5E 04 KG 3.2E 04 LB	9.5E 01 4.2E 02	1.2E 01 5.7E 02	8.9E-01 4.0E-01	9.0E-02 4.1E-02	1.4E-02 6.5E-03	2.0E-02 KG 1.2E-02 LB
AMMONIUM BICARBONATE	1.1E 03 2.3E 03	4.1E 03 9.0E 03	1.9E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 6.5E 02	1.9E 01 8.7E 02	1.4E 00 6.2E-01	4.9E-01 2.2E-01	2.6E-01 1.2E-01	1.0E-01 KG 6.5E-02 LB
AMMONIUM BICHROMATE	4.7E 03 1.3E 04	2.2E 04 4.9E 04	1.2E 04 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.4E 02	1.6E 01 7.0E 02	1.2E 00 5.3E-01	9.0E-02 4.1E-02	6.5E-02 2.1E-02	2.0E-02 KG 1.2E-02 LB
AMMONIUM BIFLUORIDE	4.4E 03 9.7E 03	2.2E 04 4.9E 04	7.4E 03 1.6E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.7E 02	1.7E 01 7.5E 02	1.2E 00 5.4E-01	9.0E-02 4.1E-02	6.1E-02 2.8E-02	2.6E-02 KG 1.2E-02 LB
AMMONIUM BISULFITE	1.4E 04 3.1E 04	2.2E 04 4.9E 04	2.0E 04 5.4E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 6.5E 02	1.5E 01 6.8E 02	9.5E-01 4.3E-01	9.0E-02 4.1E-02	1.7E-02 7.9E-03	2.4E-02 KG 1.2E-02 LB
AMMONIUM BROMIDE	4.4E 02 1.1E 03	2.1E 03 4.6E 03	8.2E 02 1.8E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 02	2.0E 01 9.2E 02	1.4E 00 6.0E-01	4.9E-01 2.2E-01	5.6E-01 2.5E-01	1.0E-01 KG 6.5E-02 LB
AMMONIUM CARBAMATE	4.7E 02 8.7E 02	4.1E 02 9.0E 02	4.7E 02 1.5E 03	2.3E 02 KG 5.0E 02 LB	1.0E 01 7.1E 02	2.1E 01 9.4E 02	1.5E 00 6.7E-01	4.9E 00 2.2E 00	6.0E-01 3.1E-01	1.0E 01 KG 6.5E-01 LB
AMMONIUM CARBONATE	1.5E 03 3.4E 03	2.2E 04 4.9E 04	2.4E 03 5.7E 03	1.5E 04 KG 3.2E 04 LB	1.4E 01 6.5E 02	1.9E 01 8.6E 02	1.4E 00 6.1E-01	9.0E-02 4.1E-02	1.8E-01 8.0E-02	2.0E-02 KG 1.2E-02 LB
AMMONIUM CHLORIDE	2.4E 02 5.4E 02	4.1E 02 9.0E 02	6.5E 02 9.0E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 02	2.1E 01 9.4E 02	1.5E 00 6.7E-01	4.9E 00 2.2E 00	1.9E 00 8.7E-01	1.4E 00 KG 6.5E-01 LB
AMMONIUM CHROMATE	1.1E 04 2.7E 04	2.2E 04 4.9E 04	1.0E 04 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 02	1.5E 01 6.7E 02	1.0E 00 4.5E-01	9.0E-02 4.1E-02	2.6E-02 1.2E-02	2.4E-02 KG 1.2E-02 LB
AMMONIUM CITRATE,	1.0E 04 3.5E 04	2.2E 04 4.9E 04	2.7E 04 5.4E 04	1.5E 04 KG 3.2E 04 LB	8.0E 03 4.0E 03	1.2E 01 5.3E 02	8.4E-01 3.8E-01	9.0E-02 4.1E-02	1.7E-02 7.8E-03	2.4E-02 KG 1.2E-02 LB
AMMONIUM FLUOBORATE	5.5E 02 1.2E 03	4.1E 03 9.0E 03	4.9E 02 2.4E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 02	2.0E 01 9.1E 02	1.4E 00 6.5E-01	4.9E-01 2.2E-01	5.1E-01 2.3E-01	1.0E-01 KG 6.5E-02 LB
AMMONIUM FLUORIDE	8.9E 03 1.9E 04	2.2E 04 4.9E 04	1.5E 04 3.3E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 02	1.5E 01 6.8E 02	1.1E 00 4.9E-01	9.0E-02 4.1E-02	3.1E-02 1.4E-02	2.0E-02 KG 1.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIUM PERMATE	4.0E 03 1.9E 04	2.2E 04 9.9E 04	1.0E 04 4.5E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.0E 01 7.1E 00	1.1E 00 5.2E-01	9.4E-02 4.1E-02	3.2E-02 1.4E-02	2.8E-02 KG 1.2E-02 LB
AMMONIUM HYDROXIDE	4.0E 02 1.5E 03	6.1E 03 2.8E 03	1.1E 03 2.9E 03	2.1E 03 LTR 5.5E 02 GAL	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.0E 00 6.3E-01	8.9E-01 2.2E-01	8.2E-01 1.9E-01	1.0E-01 LTR 5.0E-01 GAL
AMMONIUM HYDROPHOSPHITE	9.1E 02 9.1E 02	9.1E 04 9.2E 02	7.0E 02 1.9E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.0E 00 6.5E-01	4.9E 03 2.2E 00	6.5E-01 3.0E-01	1.4E 00 KG 6.5E-01 LB
AMMONIUM IODIDE	7.0E 02 1.5E 03	9.1E 03 9.2E 03	1.2E 03 2.6E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.0E 00 6.5E-01	4.9E-01 2.2E-01	3.9E-01 1.8E-01	1.4E-01 KG 6.5E-02 LB
AMMONIUM MOLYBDATE	9.0E 02 1.1E 03	8.1E 03 9.2E 03	8.2E 02 1.0E 03	2.1E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.0E 00 6.0E-01	8.9E-01 2.2E-01	9.8E-01 2.9E-01	1.0E-01 KG 6.5E-02 LB
AMMONIUM NITRATE	5.9E 02 8.0E 02	9.1E 02 9.0E 02	6.0E 02 1.5E 03	2.5E 02 KG 5.0E 02 LB	1.9E 01 7.0E 00	2.1E 01 9.0E 00	1.5E 00 6.7E-01	8.9E 00 2.2E 00	6.9E-01 3.1E-01	1.4E 00 KG 6.5E-01 LB
AMMONIUM OXALATE	9.0E 03 2.1E 04	2.2E 04 9.9E 04	1.0E 04 5.0E 04	1.5E 04 KG 3.2E 04 LB	9.2E 00 4.2E 00	1.2E 01 5.0E 00	8.7E-01 4.0E-01	9.4E-02 4.1E-02	2.8E-02 1.3E-02	2.8E-02 KG 1.2E-02 LB
AMMONIUM PENTABORATE	1.5E 03 2.9E 03	9.1E 03 9.2E 03	2.2E 03 4.9E 03	2.5E 03 KG 5.0E 03 LB	1.0E 01 4.2E 00	1.0E 01 8.2E 00	1.3E 00 5.9E-01	4.9E-01 2.2E-01	2.9E-01 9.3E-02	1.0E-01 KG 6.5E-02 LB
AMMONIUM PERSULFATE	9.7E 02 1.3E 03	9.1E 03 9.2E 03	9.7E 02 2.1E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.6E 00	1.9E 01 9.0E 00	1.0E 6.3E-01	4.9E-01 2.2E-01	4.0E-01 2.2E-01	1.0E-01 KG 6.5E-02 LB
AMMONIUM SILICOFLUORIDE	2.2E 03 4.9E 03	9.1E 03 9.2E 03	5.7E 03 8.2E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.0E 01 4.3E 00	1.3E 00 5.9E-01	4.9E-01 2.2E-01	1.2E-01 5.0E-02	1.0E-01 KG 6.5E-02 LB
AMMONIUM SULFAMATE	4.9E 03 2.2E 04	2.2E 04 9.9E 04	1.5E 04 5.3E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	9.8E-02 4.1E-02	3.1E-02 1.4E-02	2.8E-02 KG 1.2E-02 LB
AMMONIUM SULFATE	5.5E 02 7.7E 02	9.1E 02 9.2E 02	5.9E 02 1.3E 03	2.5E 02 KG 5.0E 02 LB	1.5E 01 6.8E 00	2.0E 01 9.0E 00	1.0E 00 6.5E-01	4.9E 00 2.2E 00	7.7E-01 3.5E-01	1.0E 00 KG 6.5E-01 LB
AMMONIUM SULFIDE	1.1E 04 2.4E 04	2.2E 04 9.9E 04	1.0E 04 4.1E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	9.0E-02 4.1E-02	2.5E-02 1.1E-02	2.8E-02 KG 1.2E-02 LB
AMMONIUM SULFITE	1.1E 04 2.3E 04	2.2E 04 9.9E 04	1.0E 04 3.9E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.2E 00 4.8E-01	9.0E-02 4.1E-02	2.6E-02 1.2E-02	2.8E-02 KG 1.2E-02 LB
AMMONIUM TARTRATE	1.5E 04 2.8E 04	2.2E 04 9.9E 04	2.1E 04 4.7E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	9.0E-02 4.1E-02	2.2E-02 9.8E-03	2.8E-02 KG 1.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIUM THIOCYANATE	5.7E 03 1.1E 04	2.2E 04 4.9E 04	8.5E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 04 5.5E-01	9.8E-02 4.1E-02	5.5E-02 2.5E-02	2.0E-02 KG 1.2E-02 LB
AMMONIUM THIOSULFATE	1.2E 04 2.6E 04	2.2E 04 4.9E 04	2.8E 04 6.3E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.6E 00	1.0E 00 4.7E-01	9.8E-02 4.1E-02	2.3E-02 1.1E-02	2.0E-02 KG 1.2E-02 LB
AMYL ACETATE	2.9E 03 6.3E 03	6.1E 03 9.9E 03	6.8E 03 1.1E 04	2.1E 03 LTR 5.5E 02 GAL	1.8E 01 8.7E 00	1.4E 01 6.2E 00	9.7E-01 4.6E-01	3.1E-01 1.4E-01	8.4E-02 3.8E-02	9.7E-02 LTR 3.6E-01 GAL
ANILINE	8.8E 02 1.1E 03	6.1E 03 9.9E 03	8.2E 02 1.8E 03	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	6.1E-01 2.8E-01	5.0E-01 2.5E-01	1.8E-01 LTR 6.8E-01 GAL
ANTIMONY PENTACHLORIDE	9.7E 02 2.1E 03	6.1E 03 9.9E 03	1.8E 03 3.8E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.0E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.2E 00 6.7E-01	2.5E-01 1.1E-01	3.1E-01 KG 1.4E-01 LB
ANTIMONY PENTAFLUORIDE	3.7E 02 8.7E 02	6.1E 02 9.8E 02	5.1E 02 1.1E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	1.0E 01 4.7E 00	7.0E-01 3.0E-01	3.1E 00 KG 1.4E 00 LB
ANTIMONY POTASSIUM TARTRATE	1.4E 03 3.1E 03	6.1E 03 9.9E 03	2.0E 03 5.2E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	1.0E 00 4.7E-01	1.7E-01 7.7E-02	3.1E-01 KG 1.4E-01 LB
ANTIMONY TRIBROMIDE	1.2E 03 2.6E 03	6.1E 03 9.9E 03	2.9E 03 6.4E 03	2.3E 03 KG 5.0E 03 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E 00 4.7E-01	2.0E-01 9.1E-02	3.1E-01 KG 1.4E-01 LB
ANTIMONY TRICHLORIDE	7.5E 02 1.6E 03	6.1E 03 9.8E 03	1.3E 03 2.8E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.8E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	1.0E 00 4.7E-01	3.2E-01 1.4E-01	3.1E-01 KG 1.4E-01 LB
ANTIMONY TRIFLUORIDE	5.7E 02 1.3E 03	6.1E 03 9.8E 03	9.7E 02 2.1E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	1.0E 00 4.7E-01	4.2E-01 1.9E-01	3.1E-01 KG 1.4E-01 LB
ANTIMONY TRIIODIDE	1.4E 03 3.0E 03	6.1E 03 9.8E 03	2.4E 03 6.1E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.8E 00	1.4E 00 6.1E-01	1.0E 00 4.7E-01	1.5E-01 6.8E-02	3.1E-01 KG 1.4E-01 LB
ANTIMONY TRIOXIDE	6.4E 03 9.7E 03	2.2E 04 4.9E 04	7.4E 03 1.6E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	1.9E-01 8.7E-02	5.6E-02 2.5E-02	5.6E-02 KG 2.5E-02 LB
ARSENIC ACID	6.8E 02 1.1E 03	9.7E 01 5.2E 02	8.2E 02 1.8E 03	1.9E 01 LTR 5.0E 00 GAL	1.5E 01 6.9E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	1.2E 02 5.5E 01	6.9E-01 2.2E-01	3.7E 01 LTR 1.4E 02 GAL
ARSENIC DISULFIDE	6.8E 02 1.1E 03	5.7E 01 8.2E 01	8.2E 02 1.8E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	8.1E 01 3.7E 01	4.0E-01 1.8E-01	2.5E 01 KG 1.1E 01 LB
ARSENIC PENTOXIDE	7.9E 02 1.5E 03	5.7E 01 8.2E 01	1.2E 03 2.6E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.2E 02 5.5E 01	3.4E-01 1.5E-01	3.7E 01 KG 1.7E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ARSENIC TRI-BROMIDE	1.4E 03 3.1E 03	3.7E 01 8.2E 01	2.4E 03 5.2E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.9E 00	1.7E 01 7.9E 00	1.2E 00 5.0E-01	1.2E 02 5.5E 01	1.7E-01 7.7E-02	3.7E 01 KG 1.7E 01 LB
ARSENIC TRI-CHLORIDE	8.3E 02 1.9E 03	3.7E 01 8.2E 01	1.4E 03 3.1E 03	2.3E 01 KG 5.2E 01 LB	1.4E 01 3.3E 00	1.4E 01 8.3E 00	1.3E 00 6.4E-01	1.2E 02 5.5E 01	2.0E-01 1.3E-01	3.7E 01 KG 1.7E 01 LB
ARSENIC TRI-FLUORIDE	4.1E 02 1.0E 03	3.7E 01 8.2E 01	1.8E 03 2.3E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.4E 01 8.2E 00	1.3E 00 5.9E-01	1.2E 02 5.5E 01	3.9E-01 1.8E-01	3.7E 01 KG 1.7E 01 LB
ARSENIC TRI-IODIDE	2.3E 03 4.9E 03	3.7E 01 8.2E 01	3.4E 03 7.5E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.4E 01 8.3E 00	1.3E 00 5.9E-01	1.2E 02 5.5E 01	1.2E-01 5.3E-02	3.7E 01 KG 1.7E 01 LB
ARSENIC TRIOXIDE	4.4E 02 9.7E 02	3.7E 01 8.2E 01	7.4E 02 1.6E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.4E 00	1.4E 00 6.1E-01	1.2E 02 5.5E 01	5.4E-01 2.5E-01	3.7E 01 KG 1.7E 01 LB
ARSENIC TRISULFIDE	5.3E 02 1.2E 03	3.7E 01 8.2E 01	8.9E 02 2.0E 03	2.3E 01 KG 5.0E 01 LB	8.8E 00 2.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.1E 01 3.7E 01	3.6E-01 1.7E-01	2.5E 01 KG 1.1E 01 LB
BENZENE	1.4E 03 3.0E 03	6.1E 03 9.6E 03	2.3E 03 5.1E 03	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 6.0E 00	1.0E 01 8.0E 00	1.3E 00 5.7E-01	1.0E-01 8.3E-02	7.4E-02 3.4E-02	5.4E-02 LTR 2.0E-01 GAL
BENZOIC ACID	7.9E 03 1.7E 04	2.2E 04 4.9E 04	1.3E 04 2.9E 04	1.3E 04 LTR 4.0E 03 GAL	9.5E 00 2.3E 00	1.3E 01 5.0E 00	9.1E-01 4.1E-01	9.0E-02 4.1E-02	3.4E-02 1.6E-02	2.6E-02 LTR 1.0E-01 GAL
BENZONITRILE	3.4E 03 7.6E 03	9.1E 03 9.2E 03	5.0E 03 1.1E 04	2.3E 03 KG 5.0E 03 LB	1.1E 01 4.0E 00	1.4E 01 4.4E 00	1.2E 00 4.6E-01	6.1E-01 2.8E-01	7.9E-02 3.6E-02	1.0E-01 KG 8.2E-02 LB
BENZOYL CHLORIDE	7.9E 03 1.7E 04	2.2E 04 4.9E 04	1.3E 04 2.9E 04	1.3E 04 LTR 4.0E 03 GAL	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	1.1E-01 5.1E-02	3.4E-02 1.6E-02	3.3E-02 LTR 1.2E-01 GAL
BENZYL CHLORIDE	7.4E 03 1.5E 04	2.2E 04 4.9E 04	1.2E 04 2.6E 04	1.3E 04 LTR 4.4E 03 GAL	8.8E 00 3.8E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	6.7E-02 3.1E-02	2.7E-02 1.2E-02	2.0E-02 LTR 7.5E-02 GAL
BERYLLIUM CHLORIDE	5.4E 03 1.3E 04	4.2E 04 4.9E 04	9.9E 03 2.2E 04	1.3E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.4E 01 7.4E 00	1.2E 00 5.3E-01	1.9E-01 8.7E-02	4.1E-02 1.8E-02	5.0E-02 KG 2.5E-02 LB
BERYLLIUM FLUORIDE	1.0E 02 1.4E 02	4.1E 02 9.0E 02	2.0E 02 6.1E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.8E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	1.0E 01 4.7E 00	1.5E 00 6.6E-01	3.1E 04 KG 1.4E 04 LB
BERYLLIUM HYDROXIDE	2.5E 03 5.5E 03	4.1E 03 9.2E 03	4.2E 03 9.3E 03	2.3E 03 KG 5.0E 03 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	6.1E-01 2.8E-01	7.7E-02 3.5E-02	1.0E-01 KG 8.2E-02 LB
BERYLLIUM NITRATE	1.0E 04 4.0E 04	2.2E 04 4.9E 04	3.1E 04 6.8E 04	1.5E 04 KG 3.2E 04 LB	1.5E 01 6.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	1.9E-01 8.7E-02	1.3E-02 5.9E-03	5.0E-02 KG 2.5E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
BERYLLIUM SULFATE	1.0E 04 2.5E 04	2.2E 04 4.9E 04	1.0E 04 3.9E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 01	1.5E 01 6.8E 00	1.1E 00 4.6E-01	1.9E-01 8.7E-02	2.3E-02 1.0E-02	5.0E-02 KG 2.5E-02 LB
BRUCINE	1.7E 03 2.7E 03	4.1E 02 9.0E 02	2.1E 03 4.0E 03	2.3E 02 KG 5.0E 02 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.0E-01	1.1E 01 5.2E 00	1.0E-01 7.1E-02	5.2E 00 KG 1.9E 00 LB
BUTYL ACETATE	2.9E 03 5.0E 03	4.1E 03 9.0E 03	4.3E 03 9.5E 03	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 5.0E 00	1.5E 01 6.8E 00	1.0E 00 4.7E-01	8.9E-01 2.2E-01	1.1E-01 5.7E-02	1.4E-01 LTR 5.4E-01 GAL
BUTYL AMINE	9.0E 02 1.9E 03	4.1E 03 9.2E 03	1.5E 03 3.3E 03	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	3.7E-01 1.7E-01	3.7E-01 1.7E-01	1.1E-01 LTR 0.1E-01 GAL
BUTYRIC ACID	8.9E 03 1.9E 04	4.1E 02 9.2E 02	1.5E 04 3.3E 04	2.1E 02 LTR 5.5E 01 GAL	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	6.1E 00 2.8E 00	3.7E-02 1.7E-02	1.0E 00 LTR 0.0E 00 GAL
CADMIUM ACETATE	2.0E 02 4.1E 02	3.7E 01 8.2E 01	6.7E 02 1.0E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	6.1E 01 3.7E 01	2.2E 00 1.0E 00	2.5E 01 KG 1.1E 01 LB
CADMIUM BROMIDE	1.3E 02 2.3E 02	3.7E 01 4.2E 01	5.0E 02 1.2E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 6.0E 00	2.0E 01 9.2E 00	1.3E 00 6.0E-01	8.1E 01 3.7E 01	1.0E 00 7.0E-01	2.5E 01 KG 1.1E 01 LB
CADMIUM CHLORIDE	2.2E 02 4.8E 02	3.7E 01 8.2E 01	5.7E 02 8.2E 02	2.3E 01 KG 5.0E 01 LB	1.0E 01 7.2E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	8.1E 01 3.7E 01	2.5E 00 1.1E 00	2.5E 01 KG 1.1E 01 LB
CADMIUM NITRATE	1.7E 02 4.0E 02	3.7E 01 8.2E 01	5.1E 02 1.1E 03	2.3E 01 KG 5.0E 01 LB	1.0E 01 7.1E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	8.1E 01 3.7E 01	1.6E 00 8.2E-01	2.5E 01 KG 1.1E 01 LB
CADMIUM SULFATE	2.5E 02 5.4E 02	3.7E 01 8.2E 01	4.2E 02 9.2E 02	2.3E 01 KG 5.0E 01 LB	1.0E 01 7.1E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	9.1E 01 3.7E 01	2.2E 00 1.0E 00	2.5E 01 KG 1.1E 01 LB
CALCIUM ARSENATE	7.2E 02 1.5E 03	3.7E 01 8.2E 01	1.2E 03 2.6E 03	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.6E 01 7.3E 00	1.2E 00 5.2E-01	8.1E 01 3.7E 01	2.7E-01 1.2E-01	2.5E 01 KG 1.1E 01 LB
CALCIUM ARSENITE	1.5E 03 3.9E 03	3.7E 01 8.2E 01	2.5E 03 5.0E 03	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	8.1E 01 3.7E 01	1.8E-01 8.2E-02	2.5E 01 KG 1.1E 01 LB
CALCIUM CARBIDE	8.1E 03 1.3E 04	2.2E 04 4.9E 04	1.0E 04 2.3E 04	1.5E 04 KG 3.2E 04 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.2E-01 4.1E-01	9.2E-02 4.1E-02	3.9E-02 1.8E-02	2.0E-02 KG 1.2E-02 LB
CALCIUM CHROMATE	1.0E 04 2.3E 04	2.2E 04 4.9E 04	1.7E 04 3.8E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	1.9E-01 8.7E-02	2.4E-02 1.2E-02	5.0E-02 KG 2.5E-02 LB
CALCIUM CYANIDE	9.7E 00 2.1E 01	3.7E 01 8.2E 01	1.0E 01 3.0E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.0E-01	5.4E 01 2.4E 01	2.0E 01 1.3E 01	1.0E 01 KG 7.4E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CALCIUM (DIETHYLENE-TRIAMINE PENTA ACETATE	9.0E 02 1.9E 03	4.1E 03 9.0E 03	1.5E 03 3.3E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.5E 01	1.6E 01 7.3E 00	1.2E 00 5.2E-01	4.9E-01 2.2E-01	3.1E-01 1.4E-01	1.4E-01 KG 6.5E-02 LB
CALCIUM HYDROXIDE	7.0E 03 1.5E 04	2.2E 04 4.9E 04	1.2E 04 2.6E 04	1.5E 04 KG 3.2E 04 LB	9.5E 00 2.2E 01	1.2E 01 5.7E 00	8.9E-01 4.2E-01	9.0E-02 4.1E-02	3.8E-02 1.7E-02	2.6E-02 KG 1.2E-02 LB
CALCIUM HYPO-CHLORITE	1.1E 01 2.4E 01	3.7E 01 8.2E 01	1.9E 01 4.1E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 4.9E 00	1.4E 01 6.6E 00	1.2E 00 4.7E-01	5.4E 01 2.4E 01	2.4E 01 1.1E 01	1.6E 01 KG 7.4E 00 LB
CALCIUM OXIDE	9.3E 01 2.0E 04	2.2E 04 4.9E 04	9.0E 03 2.0E 04	1.5E 04 KG 3.2E 04 LB	9.8E 00 4.9E 00	1.3E 01 5.9E 00	9.3E-01 4.2E-01	9.0E-02 4.1E-02	5.1E-02 2.3E-02	2.6E-02 KG 1.2E-02 LB
CAPTAN (PURE)	1.4E 01 3.1E 01	3.7E 01 8.2E 01	2.4E 01 5.2E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 5.1E 00	1.5E 01 6.9E 00	1.1E 00 4.8E-01	2.7E 01 1.2E 01	1.4E 01 6.2E 00	6.2E 01 KG 2.7E 00 LB
CAPTAN (TECHNICAL)	1.4E 01 3.1E 01	3.7E 01 8.2E 01	2.4E 01 5.2E 01	2.3E 01 KG 5.0E 01 LB	1.0E 01 4.9E 00	2.0E 01 9.1E 00	1.4E 00 6.3E-01	5.4E 01 2.4E 01	1.9E 01 8.7E 00	1.8E 01 KG 7.4E 00 LB
CARBON DISULFIDE	5.0E 03 1.1E 04	4.1E 03 9.0E 03	1.2E 04 2.7E 04	2.1E 03 LTK 5.5E 02 GAL	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	6.9E-01 2.2E-01	6.8E-02 3.0E-02	1.4E-01 LTK 5.4E-01 GAL
CATECHOL	6.1E 02 1.4E 03	4.1E 03 9.0E 03	1.2E 03 2.5E 03	2.1E 03 LTK 5.5E 02 GAL	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	4.9E-01 2.2E-01	4.4E-01 2.0E-01	1.4E-01 LTK 5.4E-01 GAL
CHLORINE	4.4E 02 9.7E 02	3.7E 01 8.2E 01	7.4E 00 1.6E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 4.9E 00	1.4E 01 6.6E 00	1.2E 00 4.7E-01	5.4E 01 2.4E 01	6.4E 01 2.9E 01	1.6E 01 KG 7.4E 00 LB
CHLORINATED (PHENOL)	9.7E-01 2.1E 00	3.7E 01 8.2E 01	1.6E 00 3.6E 00	1.9E 01 LTK 5.0E 00 GAL	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	1.5E 02 6.7E 01	4.5E 02 2.0E 02	4.5E 01 LTK 1.7E 02 GAL
CHLOROANE (METTANLE)	9.7E-01 2.1E 00	3.7E 01 8.2E 01	1.6E 00 3.6E 00	2.3E 01 KG 5.0E 01 LB	1.1E 01 5.2E 00	1.5E 01 6.9E 00	1.1E 00 5.2E-01	2.4E 02 1.1E 02	6.3E 02 2.9E 02	7.6E 01 KG 3.3E 01 LB
CHLOROBENZENE	6.9E 02 1.5E 03	4.1E 02 9.0E 02	1.5E 03 3.3E 03	2.1E 02 LTK 5.5E 01 GAL	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	7.3E 02 3.3E 02	3.2E-01 1.4E-01	2.2E 00 LTK 8.2E 00 GAL
CHLOROFORM	9.9E 03 1.2E 04	4.1E 02 9.0E 02	9.3E 03 2.0E 04	2.1E 02 LTK 5.5E 01 GAL	1.2E 01 5.7E 00	1.7E 01 7.9E 00	1.2E 00 5.4E-01	7.3E 02 3.3E 02	5.1E-02 2.3E-02	2.2E 00 LTK 8.2E 00 GAL
CHLOROBENZENIC ACID	3.2E 03 7.0E 03	4.1E 03 9.0E 03	5.5E 03 1.2E 04	2.1E 03 LTK 5.5E 02 GAL	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	4.9E-01 2.2E-01	8.3E-02 3.8E-02	1.4E-01 LTK 5.4E-01 GAL
CHROMIC ACETATE	2.7E 02 6.0E 02	4.1E 02 9.0E 02	4.6E 02 1.0E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.6E 00	1.5E 00 6.7E-01	1.8E 01 4.7E 02	9.9E-01 4.5E-01	3.1E 00 KG 1.4E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CHROMIC ACID	1.4E 03 3.2E 03	4.1E 03 9.0E 03	2.5E 03 5.4E 03	2.1E 03 LTR 5.5E 02 GAL	1.4E 01 3.5E 00	1.9E 01 8.7E 00	1.0E 00 6.2E-01	1.0E 00 4.7E-01	1.9E-01 8.6E-02	3.1E-01 LTR 1.2E 00 GAL
CHROMIC SULFATE	4.2E 02 9.7E 02	4.1E 02 9.0E 02	8.7E 02 1.9E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.9E 00	2.0E 01 9.2E 00	1.0E 00 6.6E-01	1.0E 01 4.7E 00	6.0E-01 3.1E-01	3.1E 00 KG 1.4E 00 LB
CHROMOUS CARBONATE	1.2E 02 2.7E 02	4.1E 02 9.0E 02	2.1E 03 4.6E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.7E 00	2.0E 01 9.3E 00	1.0E 00 6.4E-01	1.0E 01 4.7E 00	1.0E 00 7.1E-01	3.1E 00 KG 1.4E 00 LB
CHROMOUS CHLORIDE	1.3E 02 2.9E 02	4.1E 02 9.0E 02	2.2E 03 4.9E 03	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.2E 00	2.1E 01 9.4E 00	1.5E 00 9.9E-01	1.0E 01 4.7E 00	2.0E 00 9.3E-01	3.1E 00 KG 1.4E 00 LB
CHROMOUS OXALATE	1.9E 02 3.9E 02	4.1E 02 9.0E 02	3.2E 03 6.9E 03	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.3E 00 8.7E-01	1.0E 01 4.7E 00	1.9E 00 7.0E-01	3.1E 00 KG 1.4E 00 LB
CHROMYL CHLORIDE	2.2E 03 4.9E 03	4.1E 03 9.0E 03	3.9E 03 8.3E 03	2.3E 03 KG 5.0E 03 LB	1.7E 01 7.9E 00	2.3E 01 1.1E 01	1.7E 00 1.1E 00	1.2E 01 4.7E-01	1.2E-01 5.5E-02	3.1E-01 KG 1.4E-01 LB
COBALTOUS ACETATE	1.8E 03 4.1E 03	4.1E 03 9.0E 03	3.1E 03 6.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	1.2E 00 4.7E-01	1.3E-01 5.8E-02	3.1E-01 KG 1.4E-01 LB
COBALTOUS AMMINE	1.6E 03 3.6E 03	4.1E 03 9.0E 03	2.8E 03 6.1E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.7E 01 8.0E 00	1.4E 00 6.1E-01	1.2E 00 4.7E-01	1.5E-01 6.6E-02	3.1E-01 KG 1.4E-01 LB
COBALTOUS CHLORIDE	1.4E 03 3.0E 03	4.1E 03 9.0E 03	3.2E 03 6.5E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.0E 00 4.7E-01	1.4E-01 6.1E-02	3.1E-01 KG 1.4E-01 LB
COBALTOUS CITRATE	1.4E 03 3.2E 03	4.1E 03 9.0E 03	2.5E 03 5.4E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.9E 01 8.4E 00	1.3E 00 6.4E-01	1.0E 00 4.7E-01	1.6E-01 7.4E-02	3.1E-01 KG 1.4E-01 LB
COBALTOUS FLUORIDE	4.8E 02 1.1E 03	4.1E 03 9.0E 03	8.2E 02 1.8E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.0E 00 4.7E-01	4.9E-01 2.2E-01	3.1E-01 KG 1.4E-01 LB
COBALTOUS FORMATE	1.4E 03 3.2E 03	4.1E 03 9.0E 03	2.3E 03 5.1E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.0E 00 4.7E-01	1.7E-01 7.9E-02	3.1E-01 KG 1.4E-01 LB
COBALTOUS IODIDE	2.3E 03 5.1E 03	4.1E 03 9.0E 03	3.9E 03 8.7E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.8E 01 8.4E 00	1.3E 00 6.2E-01	1.0E 00 4.7E-01	1.8E-01 8.6E-02	3.1E-01 KG 1.4E-01 LB
COBALTOUS NITRATE	2.2E 03 4.7E 03	4.1E 03 9.0E 03	3.0E 03 6.8E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.9E 01 8.4E 00	1.3E 00 6.3E-01	1.0E 00 4.7E-01	1.1E-01 5.0E-02	3.1E-01 KG 1.4E-01 LB
COBALTOUS PERCHLORATE	2.7E 03 6.0E 03	4.1E 03 9.0E 03	4.0E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.1E 00	1.9E 01 8.1E 00	1.3E 00 5.8E-01	1.0E 00 4.7E-01	8.7E-02 4.0E-02	3.1E-01 KG 1.4E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ETHALTOUS SUCCINATE	0.8E 02 1.9E 03	0.1E 03 0.2E 03	1.3E 03 3.3E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 3.9E 00	1.7E 01 7.9E 00	1.2E 00 5.0E-01	1.9E 00 4.7E-01	2.2E-01 9.9E-02	3.1E-01 KG 1.4E-01 LB
ETHALTOUS SULFAMATE	1.0E 03 3.9E 03	0.1E 03 0.2E 03	3.4E 03 6.5E 03	2.3E 03 KG 5.2E 03 LB	1.3E 01 6.2E 00	1.0E 01 8.2E 00	1.3E 00 5.7E-01	1.9E 00 4.7E-01	1.4E-01 6.1E-02	3.1E-01 KG 1.4E-01 LB
ETHALTOUS SULFATE	2.1E 03 4.6E 03	0.1E 03 0.2E 03	3.6E 03 7.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.8E 01 8.3E 00	1.3E 00 6.0E-01	1.9E 00 4.7E-01	1.1E-01 5.1E-02	3.1E-01 KG 1.4E-01 LB
ETHAPHOS (PURE)	7.9E 00 1.7E 01	3.7E 01 9.2E 01	1.3E 01 2.9E 01	2.3E 01 KG 9.2E 01 LB	1.2E 01 5.6E 00	1.4E 01 7.4E 00	1.2E 00 5.3E-01	6.7E 01 5.1E 01	2.4E 01 1.1E 01	2.1E 01 KG 9.3E 00 LB
ETHAPHOS (ETHYLAMINE)	7.9E 00 1.7E 01	3.7E 01 9.2E 01	1.3E 01 2.9E 01	2.3E 01 KG 9.2E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.1E 02 9.2E 01	3.4E 01 1.6E 01	3.9E 01 KG 1.4E 01 LB
ETHRIOL	4.4E 02 9.7E 02	0.1E 02 0.2E 02	7.4E 02 1.6E 03	2.1E 02 LTN 9.5E 01 GAL	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	6.1E 00 2.8E 00	6.1E-01 2.8E-01	1.8E 00 LTN 8.1E 00 GAL
CUPRIC ACETATE	1.1E 03 2.5E 03	0.1E 03 0.2E 03	1.9E 03 4.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.0E 00 4.7E-01	2.1E-01 9.4E-02	3.1E-01 KG 1.4E-01 LB
CUPRIC ACETOARSENITE	7.9E 01 1.8E 02	3.7E 01 8.2E 01	1.3E 02 2.8E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.5E 00 6.6E-01	8.1E 01 3.7E 01	2.6E 00 1.2E 00	2.5E 01 KG 1.1E 01 LB
CUPRIC ACETYL-ACETONATE	7.9E 01 1.7E 02	0.1E 02 0.2E 02	1.3E 02 2.9E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	1.0E 01 4.7E 00	2.4E 00 1.1E 00	3.1E 00 KG 1.4E 00 LB
CUPRIC AMIDE	4.6E 01 1.0E 02	0.1E 02 0.2E 02	1.1E 02 2.5E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.0E 01 4.7E 00	5.6E 00 1.6E 00	3.1E 00 KG 1.4E 00 LB
CUPRIC CHLORIDE	0.8E 01 1.1E 02	0.1E 02 0.2E 02	8.2E 01 1.8E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.5E 00	2.2E 01 1.0E 01	1.6E 00 7.1E-01	1.0E 01 4.7E 00	4.9E 00 2.2E 00	3.1E 00 KG 1.4E 00 LB
CUPRIC FORMATE	0.4E 01 0.7E 01	0.1E 02 0.2E 02	7.4E 01 1.6E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.5E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.0E 01 4.7E 00	5.6E 00 2.5E 00	3.1E 00 KG 1.4E 00 LB
CUPRIC GLUCONATE	1.3E 02 2.9E 02	0.1E 02 0.2E 02	2.2E 02 4.9E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.3E 00	2.1E 01 9.7E 00	1.5E 00 6.9E-01	1.0E 01 4.7E 00	1.8E 00 8.2E-01	3.1E 00 KG 1.4E 00 LB
CUPRIC GLYCINATE	0.8E 01 1.9E 02	0.1E 02 0.2E 02	1.5E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	1.0E 01 4.7E 00	2.7E 00 1.2E 00	3.1E 00 KG 1.4E 00 LB
CUPRIC LACTATE	0.8E 01 1.9E 02	0.1E 02 0.2E 02	1.5E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.3E 00	2.2E 01 9.8E 00	1.5E 00 7.0E-01	1.0E 01 4.7E 00	2.7E 00 1.2E 00	3.1E 00 KG 1.4E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CUPRIC NITRATE	8.8E 01 1.9E 02	4.1E 02 9.0E 02	1.9E 02 3.1E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.4E 01	2.2E 01 9.9E 01	1.6E 00 7.1E-01	1.8E 01 8.2E 01	2.7E 00 1.2E 01	3.1E 00 KG 1.4E 01 LB
CUPRIC OXALATE	4.8E 01 1.1E 02	4.1E 02 9.0E 02	8.2E 01 1.8E 02	2.3E 02 KG 5.0E 02 LB	1.4E 01 6.6E 01	1.9E 01 8.5E 01	1.3E 00 6.1E-01	6.1E 00 2.8E 01	4.0E 00 1.8E 01	1.0E 00 KG 4.7E-01 LB
CUPRIC SUBACETATE	5.4E 01 1.2E 02	4.1E 02 9.0E 02	9.2E 01 2.0E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.2E 01	2.1E 01 9.6E 01	1.5E 00 6.9E-01	1.0E 01 4.7E 01	4.4E 00 2.0E 01	3.1E 00 KG 1.4E 00 LB
CUPRIC SULFATE	3.5E 02 7.7E 02	4.1E 02 9.0E 02	5.9E 02 1.3E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.5E 00 6.6E-01	1.0E 01 4.7E 00	6.8E-01 3.1E-01	3.1E 00 KG 1.4E 00 LB
CUPRIC SULFATE AMMONIATED	7.9E 01 1.8E 02	4.1E 02 9.0E 02	1.3E 02 2.8E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.8E 01 8.2E 00	3.2E 00 1.4E 00	3.1E 00 KG 1.4E 00 LB
CUPRIC TARTRATE	7.4E 01 1.7E 02	4.1E 02 9.0E 02	1.3E 02 2.9E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	6.1E 00 2.8E 00	2.6E 00 1.1E 00	1.0E 00 KG 4.7E-01 LB
CUPROUS BROMIDE	4.3E 01 9.5E 01	4.1E 02 9.0E 02	7.3E 01 1.6E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	6.1E 00 2.8E 00	4.5E 00 2.0E 00	1.0E 00 KG 4.7E-01 LB
CUPROUS IODIDE	5.0E 01 1.2E 02	4.1E 02 9.0E 02	9.4E 01 2.1E 02	2.3E 02 KG 5.0E 02 LB	1.3E 01 5.8E 00	1.7E 01 7.9E 00	1.2E 00 5.5E-01	6.1E 00 2.8E 00	5.4E 00 1.6E 00	1.0E 00 KG 4.7E-01 LB
CYANOGEN CHLORIDE	3.5E 00 7.7E 00	9.7E 01 2.2E 02	5.9E 00 1.3E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.8E 00	1.2E 00 5.4E-01	1.3E 02 6.1E 01	9.2E 01 4.2E 01	6.1E 01 KG 1.4E 01 LB
CYCLOHEXANE	1.4E 03 3.2E 03	4.1E 03 9.2E 03	2.3E 03 5.1E 03	2.1E 03 LTR 5.5E 02 GAL	9.1E 01 4.1E 01	1.2E 01 5.5E 00	8.7E-01 3.9E-01	1.0E-01 4.3E-02	7.4E-02 3.4E-02	5.4E-02 LTR 2.0E-01 GAL
2,4-D ACID (PURE)	1.5E 04 3.4E 04	2.2E 04 4.9E 04	2.6E 04 5.7E 04	1.5E 04 KG 3.2E 04 LB	1.4E 01 6.7E 01	1.4E 01 6.2E 00	9.7E-01 4.4E-01	8.9E-02 2.7E-02	1.2E-02 5.7E-03	1.3E-02 KG 6.0E-03 LB
2,4-D ACID (ESTERABLE)	3.9E 02 7.7E 02	9.1E 02 9.2E 02	5.9E 02 1.3E 03	2.3E 02 KG 5.2E 02 LB	1.1E 01 4.9E 01	1.4E 01 6.6E 00	1.0E 00 4.7E-01	4.9E 00 2.2E 00	7.7E-01 3.5E-01	1.4E 00 KG 6.5E-01 LB
2,4-D ESTERS (PURE)	8.8E 01 1.9E 02	4.1E 02 9.0E 02	1.5E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	2.4E 00 1.1E 00	2.2E 00 9.9E-01	7.2E-01 KG 3.3E-01 LB
2,4-D ESTERS (ESTERABLE)	4.9E 01 1.9E 02	4.1E 02 9.0E 02	1.5E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	6.9E 00 2.2E 00	3.1E 00 1.4E 00	1.4E 00 KG 6.5E-01 LB
DALAPON	4.6E 03 1.0E 04	2.2E 04 4.9E 04	7.9E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	1.9E-01 8.7E-02	5.8E-02 2.7E-02	9.6E-02 KG 2.5E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
DDT (PURE)	4.4E-01 9.7E-01	3.7E 01 8.2E 01	7.1E-01 1.6E 00	2.3E 01 KG 5.0E 01 LB	9.7E 00 4.4E 00	1.3E 01 5.9E 00	9.2E-01 4.2E-01	1.5E 02 6.7E 01	1.3E 03 6.0E 02	4.5E 01 KG 2.0E 01 LB
DDT (WETTABLE)	9.2E-01 9.2E-01	3.7E 01 8.2E 01	7.1E-01 1.6E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	2.4E 02 1.1E 02	1.9E 03 8.9E 02	7.2E 01 KG 3.3E 01 LB
DIAZINON (PURE)	9.7E-01 2.1E 00	3.7E 01 8.2E 01	1.6E 02 3.6E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.8E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	2.7E 01 1.2E 01	2.4E 02 4.0E 01	8.2E 00 KG 3.7E 00 LB
DIAZINON (WETTABLE)	9.7E-01 2.1E 00	3.7E 01 8.2E 01	1.6E 00 3.6E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	5.4E 01 2.4E 01	2.8E 02 1.3E 02	1.0E 01 KG 4.6E 00 LB
DICAMBA	1.8E 03 3.9E 03	4.1E 03 9.0E 03	3.0E 03 6.5E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.0E 00	1.8E 01 8.0E 00	1.3E 00 5.7E-01	1.8E 00 8.0E-01	2.2E-01 1.0E-01	3.1E-01 KG 1.4E-01 LB
DICHLOBENIL (PURE)	6.5E 02 1.4E 03	4.1E 03 9.0E 03	1.1E 03 2.4E 03	2.3E 03 KG 5.0E 03 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.2E-01 4.1E-01	6.1E-01 2.8E-01	6.3E-01 2.7E-01	1.4E-01 KG 6.2E-02 LB
DICHLOBENIL (WETTABLE)	6.5E 02 1.4E 03	4.1E 03 9.0E 03	1.1E 03 2.4E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.0E 00 4.7E-01	6.1E-01 2.8E-01	1.0E-01 KG 4.4E-02 LB
DICHLONE (PURE)	1.8E 00 3.9E 00	3.7E 01 8.2E 01	3.0E 00 6.5E 00	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	9.7E 01 3.1E 01	1.0E 02 7.2E 01	2.1E 01 KG 9.3E 00 LB
DICHLONE (WETTABLE)	1.8E 00 3.9E 00	3.7E 01 8.2E 01	3.0E 00 6.5E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.1E 02 5.2E 01	2.2E 02 1.0E 02	3.5E 01 KG 1.6E 01 LB
p DICHLOROB	5.1E 01 6.9E 01	3.7E 01 8.2E 01	5.2E 01 1.1E 02	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.1E 02 5.2E 01	1.3E 01 5.8E 00	3.5E 01 KG 1.6E 01 LB
DIELDRIN (PURE)	3.5E-01 7.8E-01	3.7E 01 8.2E 01	5.9E-01 1.3E 00	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.5E 02 6.7E 01	1.3E 03 5.7E 02	4.5E 01 KG 2.0E 01 LB
DIELDRIN (WETTABLE)	3.5E-01 7.8E-01	3.7E 01 8.2E 01	5.9E-01 1.3E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	2.4E 02 1.1E 02	1.8E 03 8.0E 02	7.2E 01 KG 3.3E 01 LB
DIETHYLAMINE	1.7E 03 8.2E 03	4.1E 03 9.0E 03	6.3E 03 1.4E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	3.7E-01 1.7E-01	7.5E-02 3.4E-02	1.1E-01 KG 4.9E-02 LB
DIMETHYLAMINE	1.7E 03 8.2E 03	4.1E 03 9.0E 03	6.3E 03 1.4E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	3.7E-01 1.7E-01	7.5E-02 3.4E-02	1.1E-01 KG 4.9E-02 LB
DINITROPHENOL	1.9E 03 3.4E 03	4.1E 02 9.0E 02	2.0E 03 5.7E 03	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	0.9E 00 2.2E 00	1.8E-01 8.0E-02	1.4E 00 KG 6.3E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
DIQUAT	1.5E 03 3.4E 03	4.1E 03 9.0E 03	2.0E 03 4.7E 03	2.3E 03 KG 5.0E 03 LB	1.7E 01 3.8E 01	1.8E 01 4.1E 01	1.3E 00 5.8E-01	1.2E 00 2.7E-01	1.8E-01 4.1E-01	3.1E-01 KG 1.4E-01 LB
DIELDRIN (PURE)	2.0E 00 4.4E 00	1.7E 01 3.8E 01	8.8E 00 1.9E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 3.8E 01	2.0E 01 4.5E 01	1.4E 03 6.5E-01	6.7E 01 1.5E 01	8.8E 01 1.9E 01	2.1E 01 KG 9.3E 00 LB
DISULFOTON (WETTABLE)	2.0E 00 4.4E 00	1.7E 01 3.8E 01	8.8E 00 1.9E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 3.8E 01	2.2E 01 4.9E 01	1.6E 02 7.1E-01	1.1E 02 2.5E 01	9.6E 01 2.1E 01	3.5E 01 KG 1.6E 01 LB
DIURON (PURE)	1.8E 02 3.9E 02	4.1E 02 9.0E 02	3.8E 02 8.5E 02	2.3E 02 KG 5.0E 02 LB	1.7E 01 3.8E 01	1.7E 01 3.9E 01	1.2E 00 5.4E-01	6.1E 00 2.8E 00	1.6E 00 7.2E-01	1.4E 00 KG 6.1E-01 LB
DIURON (WETTABLE)	1.8E 02 3.9E 02	4.1E 02 9.0E 02	3.8E 02 8.5E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 3.6E 01	2.1E 01 4.6E 01	1.5E 00 6.7E-01	1.7E 01 4.7E 00	2.2E 00 1.0E 00	3.1E 00 KG 1.4E 00 LB
ENDOTHALL (ACID FORM)	7.9E 02 1.7E 03	4.1E 03 9.0E 03	1.8E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	1.6E 01 3.6E 01	1.6E 01 3.4E 01	1.2E 00 5.3E-01	4.9E-01 2.2E-01	3.4E-01 1.4E-01	1.4E-01 KG 6.5E-02 LB
ENDRIN (PURE)	1.8E 00 3.9E 00	3.7E 01 8.2E 01	2.8E 00 6.1E 00	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.0E 01	1.9E 01 4.0E 01	1.4E 00 6.1E-01	6.7E 01 3.1E 01	1.2E 02 5.3E 01	2.1E 01 KG 9.3E 00 LB
ENDRIN (WETTABLE)	1.8E 00 3.9E 00	3.7E 01 8.2E 01	2.8E 00 6.1E 00	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.0E 01	2.0E 01 4.3E 01	1.4E 00 6.1E-01	1.1E 02 5.2E 01	9.6E 01 4.4E 01	3.5E 01 KG 1.6E 01 LB
ENDOSULFAN (PURE)	1.4E-01 3.2E-01	3.7E 01 8.2E 01	2.5E-01 5.4E-01	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.3E 01	2.0E 01 4.3E 01	1.4E 00 6.1E-01	6.7E 01 3.1E 01	1.1E 03 4.8E 02	2.1E 01 KG 9.3E 00 LB
ENDOSULFAN (WETTABLE)	1.4E-01 3.2E-01	3.7E 01 8.2E 01	2.5E-01 5.4E-01	2.3E 01 KG 5.0E 01 LB	1.7E 01 3.8E 01	2.3E 01 5.0E 01	1.6E 00 7.1E-01	1.1E 02 5.2E 01	1.9E 03 8.5E 02	3.9E 01 KG 1.6E 01 LB
ENDRIN (PURE)	2.8E-02 5.7E-02	1.7E 01 4.2E 01	4.5E-02 9.8E-02	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.8E 01	1.7E 01 7.7E 01	1.2E 00 5.5E-01	1.4E 02 6.7E 01	1.7E 04 7.5E 03	6.5E 01 KG 2.7E 01 LB
ENDRIN (WETTABLE)	2.8E-02 5.7E-02	1.7E 01 8.2E 01	4.5E-02 9.8E-02	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 01	1.8E 01 8.3E 01	1.3E 00 5.9E-01	2.4E 02 1.1E 02	2.3E 04 1.1E 04	7.2E 01 KG 3.3E 01 LB
ETHION (PURE)	3.7E 00 1.3E 01	3.7E 01 8.2E 01	9.7E 00 2.1E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.8E 01	1.7E 01 7.7E 01	1.2E 00 5.5E-01	6.7E 01 3.1E 01	3.0E 01 1.5E 01	2.1E 01 KG 9.3E 00 LB
ETHION (WETTABLE)	3.7E 00 1.3E 01	3.7E 01 8.2E 01	9.7E 00 2.1E 01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.2E 01	2.1E 01 9.7E 01	1.5E 00 6.9E-01	1.1E 02 5.2E 01	4.7E 01 2.1E 01	3.5E 01 KG 1.6E 01 LB
ETHYLBENZENE	1.3E 03 2.8E 03	4.1E 03 9.0E 03	2.2E 03 4.7E 03	2.1E 03 LTR 5.5E 02 GAL	8.8E 00 4.0E 01	1.2E 01 5.3E 01	0.4E+01 3.0E+01	3.7E+01 1.7E+01	1.9E+01 8.6E-02	1.1E+01 LTR 0.1E+01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ETHYLENEDIAMINE	1.3E 03 2.9E 03	9.1E 03 9.4E 03	2.2E 03 4.9E 03	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	6.1E-01 2.8E-01	2.5E-01 1.1E-01	1.8E-01 LTR 6.8E-01 GAL
SODA	2.2E 04 4.8E 04	2.2E 04 4.8E 04	3.7E 04 7.3E 04	1.5E 04 LTR 4.0E 03 GAL	8.8E 02 9.0E 04	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.1E-01 5.1E-02	1.3E-02 9.8E-03	3.3E-02 LTR 1.2E-01 GAL
FERRIC AMMONIUM CITRATE	1.1E 03 2.3E 03	4.1E 03 9.1E 03	1.9E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.6E 00	1.9E 01 8.8E 00	1.4E 00 6.5E-01	1.0E 00 4.7E-01	2.3E-01 1.0E-01	3.1E-01 KG 1.4E-01 LB
FERRIC CHLORIDE	8.8E 02 1.9E 03	4.1E 03 9.2E 03	1.5E 03 3.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.0E 00 4.7E-01	2.7E-01 1.2E-01	3.1E-01 KG 1.4E-01 LB
FERRIC FLUORIDE	8.8E 02 1.1E 03	4.1E 03 9.2E 03	8.2E 02 1.8E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.0E 00 4.7E-01	9.9E-01 2.2E-01	3.1E-01 KG 1.4E-01 LB
FERRIC NITRATE	1.9E 03 2.9E 03	8.1E 03 9.2E 03	2.2E 03 4.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.0E 00 4.7E-01	1.0E-01 9.2E-02	3.1E-01 KG 1.4E-01 LB
FERRIC PHOSPHATE	9.1E 02 1.4E 03	4.1E 03 9.2E 03	1.0E 03 2.3E 03	2.1E 03 KG 5.0E 03 LB	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	6.1E-01 2.9E-01	1.3E-01 1.4E-01	1.8E-01 KG 4.2E-02 LB
FERRIC SULFATE	8.4E 02 1.9E 03	4.1E 03 9.2E 03	1.5E 03 3.3E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.0E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	1.0E 00 4.7E-01	2.7E-01 1.2E-01	3.1E-01 KG 1.4E-01 LB
FERROUS AMMONIUM SULFATE	8.8E 02 1.9E 03	4.1E 03 9.2E 03	1.5E 03 3.3E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 7.0E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	1.0E 00 4.7E-01	2.7E-01 1.2E-01	3.1E-01 KG 1.4E-01 LB
FERROUS CHLORIDE	9.1E 02 1.4E 03	4.1E 03 9.2E 03	1.0E 03 2.3E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.0E 00 4.7E-01	3.9E-01 1.8E-01	3.1E-01 KG 1.4E-01 LB
FERROUS OXALATE	5.7E 02 1.1E 03	4.1E 03 9.2E 03	9.7E 02 2.1E 03	2.3E 03 KG 5.0E 03 LB	1.1E 01 5.0E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	9.1E-01 2.8E-01	3.9E-01 1.5E-01	1.8E-01 KG 8.2E-02 LB
FERROUS SULFATE	8.8E 02 1.9E 03	4.1E 03 9.2E 03	1.5E 03 3.3E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	1.0E 00 4.7E-01	2.7E-01 1.2E-01	3.1E-01 KG 1.4E-01 LB
FORMALDEHYDE	1.1E 03 2.4E 03	4.1E 03 9.2E 03	1.9E 03 4.1E 03	2.1E 03 LTR 5.5E 02 GAL	9.5E 01 4.3E 00	1.3E 01 5.8E 00	9.1E-01 4.1E-01	6.1E-01 2.9E-01	3.9E-01 1.3E-01	1.8E-01 LTR 6.8E-01 GAL
FORMIC ACID	7.7E 03 1.7E 04	2.8E 04 6.9E 04	1.3E 04 2.9E 04	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 4.8E 00	1.4E 01 6.4E 00	1.0E 00 4.6E-01	1.1E-01 5.1E-02	4.2E-02 1.9E-02	3.3E-02 LTR 1.2E-01 GAL
FUMARIC ACID	8.1E 03 1.3E 04	2.2E 04 6.9E 04	1.0E 04 2.3E 04	1.5E 04 LTR 4.0E 03 GAL	9.7E 00 4.4E 01	1.3E 01 5.9E 00	9.2E-01 4.2E-01	9.8E-02 4.1E-02	4.4E-02 2.0E-02	2.6E-02 LTR 1.0E-01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PIPE,OAL	1,1E 03 2,3E 03	4,1E 03 9,0E 03	1,0E 03 3,9E 03	2,1E 03 LTR 5,5E 02 GAL	1,3E 01 5,0E 02	1,7E 01 7,0E 00	1,2E 02 5,5E-01	6,1E-01 2,9E-01	2,0E-01 1,2E-01	1,0E-01 LTR 4,9E-01 GAL
GUTHION (PURE)	1,3E 02 2,9E 02	3,7E 01 8,2E 01	2,2E 00 4,9E 02	2,3E 01 KG 5,2E 01 LB	1,5E 01 6,0E 00	2,2E 01 9,0E 00	1,0E 00 4,5E-01	6,7E 01 3,1E 01	1,5E 02 6,0E 01	2,1E 01 KG 9,3E 00 LB
GUTHION (WETTABLE)	1,3E 02 2,9E 02	3,1E 01 6,2E 01	2,2E 00 4,9E 02	2,3E 01 KG 5,2E 01 LB	1,0E 01 7,2E 00	2,1E 01 9,0E 00	1,3E 02 6,9E-01	1,1E 02 5,2E 01	2,0E 02 9,3E 01	3,5E 01 KG 1,0E 01 LB
HEPTACHLOR (PURE)	8,3E+01 1,8E 02	3,7E 01 8,2E 01	1,0E 00 3,1E 02	2,3E 01 KG 5,2E 01 LB	1,2E 01 5,5E 00	1,6E 01 7,3E 00	1,2E 02 5,2E-01	1,5E 02 6,7E 01	5,2E 02 2,4E 02	4,5E 01 KG 2,0E 01 LB
HEPTACHLOR (WETTABLE)	8,3E+01 1,8E 02	3,7E 01 8,2E 01	1,0E 02 3,1E 00	2,3E 01 KG 5,2E 01 LB	1,0E 01 8,0E 00	2,0E 01 1,1E 01	1,7E 03 7,6E-01	2,4E 02 1,1E 02	7,3E 02 3,3E 02	7,2E 01 KG 3,3E 01 LB
HYDROCHLORIC ACID	2,0E 03 4,5E 03	4,1E 03 9,0E 03	3,4E 03 7,5E 03	2,1E 03 LTR 5,5E 02 GAL	1,2E 01 4,0E 00	1,3E 01 6,1E 00	9,0E-01 4,0E-01	4,9E-01 2,2E-01	1,3E-01 6,1E-02	1,0E-01 LTR 4,6E-01 GAL
HYDROFLUORIC ACID	1,0E 02 2,3E 02	4,1E 02 9,0E 02	2,3E 02 4,1E 02	2,1E 02 LTR 5,5E 01 GAL	1,0E 01 4,7E 00	1,4E 01 6,3E 00	9,0E-01 4,5E-01	6,1E 02 2,8E 00	2,0E 02 1,1E 02	1,0E 00 LTR 4,8E 00 GAL
HYDROGEN CYANIDE	7,9E 00 1,7E 01	3,7E 01 8,2E 01	1,3E 01 2,9E 01	2,3E 01 KG 5,2E 01 LB	1,3E 01 5,9E 00	1,7E 01 7,0E 00	1,2E 00 5,6E-01	6,7E 01 3,1E 01	3,5E 01 1,6E 01	2,1E 01 KG 9,3E 00 LB
HYDROXYLAMINE	2,2E 02 4,8E 02	4,1E 02 9,0E 02	3,7E 02 8,2E 02	2,3E 02 KG 5,2E 02 LB	1,2E 01 5,0E 00	1,6E 01 7,4E 00	1,2E 00 5,3E-01	6,9E 00 2,2E 00	1,2E 02 5,0E-01	1,4E 00 KG 6,5E-01 LB
METHYLAMINE	6,0E 03 1,5E 04	2,2E 04 4,9E 04	1,1E 04 2,5E 04	1,5E 04 LTR 4,2E 03 GAL	1,1E 01 5,1E 00	1,5E 01 6,8E 00	1,1E 00 4,8E-01	1,1E-01 5,1E-02	4,1E-02 1,9E-02	3,3E-02 LTR 1,2E-01 GAL
ISOPHENE	3,3E 03 7,3E 03	6,1E 03 9,0E 03	5,6E 03 1,2E 04	2,1E 03 LTR 5,5E 02 GAL	9,3E 00 4,2E 02	1,2E 01 5,7E 00	8,9E-01 4,7E-01	1,0E-01 8,3E-02	3,1E-02 1,0E-02	5,0E-02 LTR 2,2E-01 GAL
ISOPROPANOLAMINE DIN BULLONATE	6,3E 03 2,7E 03	4,1E 03 9,0E 03	1,0E 03 3,4E 03	2,3E 03 KG 5,2E 03 LB	2,2E-01 2,2E-01	2,2E-01 2,2E-01	2,2E-01 4,0E-01	6,9E-01 2,2E-01	2,9E-01 1,3E-01	1,0E-01 KG 4,5E-02 LB
METHANE (PURE)	4,4E 03 9,7E 03	4,1E 03 9,0E 03	7,4E 03 1,0E 04	2,3E 03 KG 5,2E 03 LB	1,1E 01 5,2E 00	1,5E 01 6,7E 00	1,2E 00 4,7E-01	2,4E-01 1,1E-01	6,1E-02 2,9E-02	7,2E-02 KG 3,3E-02 LB
METHANE (WETTABLE)	4,4E 03 9,7E 03	4,1E 03 9,0E 03	7,4E 03 1,0E 04	2,3E 03 KG 5,0E 03 LB	1,3E 01 5,9E 00	1,7E 01 7,8E 00	1,2E 00 5,0E-01	4,9E-01 2,2E-01	8,9E-02 4,1E-02	1,4E-01 KG 6,5E-02 LB
LEAD ACETATE	5,0E 03 1,2E 04	3,7E 01 8,2E 01	9,4E 03 2,1E 04	2,3E 01 KG 5,0E 01 LB	1,2E 01 5,7E 00	1,7E 01 7,5E 00	1,2E 00 5,4E-01	6,1E 01 3,7E 01	9,7E-02 4,4E-02	2,5E 01 KG 1,1E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
LEAD BROMIDE	5.4E 03 1.2E 04	1.7E 01 6.2E 01	9.4E 03 2.1E 04	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 01	1.9E 01 8.7E 00	1.4E 00 6.2E-01	8.1E 01 3.7E 01	9.7E-02 4.4E-02	2.3E 01 KG 1.1E 01 LB
LEAD CHLORIDE	1.9E 04 4.3E 04	1.7E 01 3.2E 01	9.3E 04 7.2E 04	2.3E 01 KG 5.0E 01 LB	9.2E 00 4.2E 01	1.2E 01 5.6E 00	6.7E-01 6.0E-01	8.1E 01 3.7E 01	2.4E-02 1.1E-02	2.3E 01 KG 1.1E 01 LB
LEAD FLUOBORATE	5.4E 03 1.2E 04	3.7E 01 8.2E 01	9.4E 03 2.1E 04	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 01	2.0E 01 9.1E 00	1.4E 00 6.5E-01	8.1E 01 3.7E 01	9.7E-02 4.4E-02	2.3E 01 KG 1.1E 01 LB
LEAD FLUORIDE	8.3E 02 1.8E 03	3.7E 01 8.2E 01	1.4E 03 3.1E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 6.0E 01	1.0E 01 4.8E 00	1.3E 00 5.7E-01	8.1E 01 3.7E 01	5.2E-01 2.4E-01	2.3E 01 KG 1.1E 01 LB
LEAD IODIDE	6.4E 03 1.4E 04	3.7E 01 8.2E 01	1.1E 04 2.5E 04	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.6E 01	1.4E 01 6.1E 00	9.7E-01 4.4E-01	8.1E 01 3.7E 01	6.4E-02 2.9E-02	2.3E 01 KG 1.1E 01 LB
LEAD NITRATE	9.2E 03 1.1E 04	3.7E 01 8.2E 01	8.5E 03 1.9E 04	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.8E 01	1.7E 01 7.9E 00	1.2E 00 5.5E-01	8.1E 01 3.7E 01	1.1E-01 4.9E-02	2.3E 01 KG 1.1E 01 LB
LEAD STEARATE	1.1E 04 2.4E 04	3.7E 01 8.2E 01	1.9E 04 4.1E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.2E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.1E 01 3.7E 01	4.9E-02 2.2E-02	2.3E 01 KG 1.1E 01 LB
LEAD SULFATE	4.4E 03 9.7E 03	3.7E 01 8.2E 01	7.5E 03 1.7E 04	2.3E 01 KG 5.0E 01 LB	1.2E 01 4.7E 01	1.4E 01 6.3E 00	9.8E-01 4.5E-01	8.1E 01 3.7E 01	9.8E-02 4.5E-02	2.3E 01 KG 1.1E 01 LB
LEAD SULFIDE	1.4E 03 7.9E 03	3.7E 01 8.2E 01	6.7E 03 1.5E 04	2.3E 01 KG 5.0E 01 LB	8.0E 00 4.2E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.1E 01 3.7E 01	1.2E-01 5.6E-02	2.3E 01 KG 1.1E 01 LB
LEAD TETRAACETATE	9.9E 03 1.4E 04	3.7E 01 8.2E 01	1.1E 04 2.4E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.2E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.1E 01 3.7E 01	8.8E-02 3.8E-02	2.3E 01 KG 1.1E 01 LB
LEAD THIOCYANATE	6.7E 03 1.7E 04	3.7E 01 8.2E 01	8.4E 03 1.9E 04	2.3E 01 KG 5.0E 01 LB	1.1E 01 4.9E 01	1.4E 01 6.2E 00	9.7E-01 4.4E-01	8.1E 01 3.7E 01	9.2E-02 4.2E-02	2.3E 01 KG 1.1E 01 LB
LEAD THIOSULFATE	6.7E 03 1.7E 04	3.7E 01 8.2E 01	8.4E 03 1.7E 04	2.3E 01 KG 5.0E 01 LB	1.2E 01 4.7E 01	1.4E 01 6.3E 00	9.8E-01 4.5E-01	8.1E 01 3.7E 01	9.8E-02 4.5E-02	2.3E 01 KG 1.1E 01 LB
LEAD TUNGSTATE	6.6E 03 1.5E 04	3.7E 01 8.2E 01	1.1E 04 2.5E 04	2.3E 01 KG 5.0E 01 LB	9.4E 00 4.5E 01	1.3E 01 5.9E 00	9.3E-01 4.2E-01	8.1E 01 3.7E 01	6.6E-02 3.0E-02	2.3E 01 KG 1.1E 01 LB
LINDANE (PURE)	1.4E 03 7.5E 03	3.7E 01 8.2E 01	5.7E 03 1.3E 04	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.4E 01	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.5E 02 6.7E 01	8.2E 01 3.7E 01	6.5E 01 KG 2.9E 01 LB
LINDANE (WETTABLE)	3.4E 03 7.5E 03	3.7E 01 8.2E 01	5.7E 03 1.3E 04	2.3E 01 KG 5.0E 01 LB	1.0E 01 8.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	2.4E 02 1.1E 02	1.2E 02 5.3E 01	7.2E 01 KG 3.3E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
LITHIUM BICHROMATE	4.5E 03 1.0E 04	2.2E 04 4.5E 04	1.0E 00 2.1E 00	1.5E 04 KG 3.2E 04 LB	1.2[illegible] P1 2.6[illegible] P2	1.0E 01 2.2E 00	1.1E 04 5.1E-01	1.9E-01 4.2E-02	3.3E-02 1.5E-02	5.0E-02 KG 2.5E-02 LB
LITHIUM CHROMATE	4.5E 03 1.0E 04	2.2E 04 4.5E 04	1.1E 04 2.4E 00	1.5E 04 KG 3.2E 04 LB	1.2[illegible] P1 2.6[illegible] P2	1.4E 01 3.0E 00	1.2E 04 5.3E-01	1.4E-01 6.7E-02	4.3E-02 1.9E-02	5.0E-02 KG 2.5E-02 LB
LITHIUM FLUORIDE	1.0E 02 2.2E 02	4.1E 02 9.0E 02	5.0E 02 4.5E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.3E 01	2.2E 01 4.8E 00	1.4E 04 6.4E-01	1.2E 01 2.7E 00	1.5E 04 7.0E-01	3.1E 02 KG 1.4E 00 [illegible]
MALATHION (PURE)	5.0E 03 1.1E 01	3.7E 01 8.2E 01	8.5E 02 1.9E 01	1.9E 01 LTR 5.0E 00 GAL	1.5E 01 3.3E 00	2.1E 0[illegible] 9.0E 00	1.5E 04 6.7E-01	6.7E 01 3.1E 01	3.0E 01 1.7E 01	2.1E 01 LTR 7.8E 01 GAL
MALATHION (EMULSIFIABLE)	5.7E 03 1.1E 01	3.7E 01 8.2E 01	8.5E 02 1.9E 01	1.9E 01 LTR 5.0E 00 GAL	1.6E 01 3.5E 00	2.2E 01 9.9E 00	1.4E 00 7.1E-01	1.1E 02 5.2E 01	5.3E 01 2.4E 01	1.5E 01 LTR 1.3E 02 GAL
MALEIC ACID	4.5E 03 1.0E 04	2.2E 04 4.5E 04	1.0E 04 2.3E 04	1.5E 04 KG 3.2E 04 LB	1.4E 01 3.0E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	9.0E-02 4.1E-02	4.0E-02 2.1E-02	2.0E-02 KG 1.2[illegible]-02 LB
MALEIC ANHYDRIDE	5.1E 03 1.1E 04	2.2E 04 4.5E 04	9.7E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.4E 01 3.0E 00	1.5E 01 6.1E 00	9.0E-01 4.0E-01	9.0E-02 4.1E-02	3.8E-02 2.5E-02	2.0E-02 KG 1.2[illegible]-02 LB
MERCURIC ACETATE	2.1E 01 4.6E 01	3.7E 01 8.2E 01	3.6E 01 7.9E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 3.6E 00	2.2E 01 1.0E 01	1.6E 04 7.3E-01	1.5E 02 6.7E 01	2.0E 01 1.2E 01	4.5E 01 KG 2.0E 01 LB
MERCURIC CHLORIDE	1.8E 01 4.0E 01	3.7E 01 8.2E 01	3.2E 01 6.7E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 3.6E 00	2.2E 01 1.0E 01	1.6E 04 7.2E-01	1.5E 02 6.7E 01	3.4E 01 1.4E 01	4.5E 01 KG 2.0E 01 LB
MERCURIC NITRATE	2.2E 01 4.9E 01	3.7E 01 8.2E 01	3.8E 01 8.3E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 3.6E 00	2.2E 01 1.0E 01	1.4E 04 7.2E-01	1.5E 02 6.7E 01	2.0E 01 1.1E 01	4.5E 01 KG 2.0E 01 LB
MERCURIC OXIDE	1.0E 01 2.1E 01	3.7E 01 8.2E 01	2.0E 01 5.2E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.3E 00	2.2E 01 9.2E 00	1.5E 03 6.6E-01	1.5E 02 6.7E 01	3.1E 01 1.4E 01	4.5E 01 KG 2.0E 01 LB
MERCURIC SULFATE	1.0E 01 2.3E 01	3.7E 01 8.2E 01	3.3E 01 7.2E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.5E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	1.5E 02 6.7E 01	2.0E 01 1.3E 01	4.5E 01 KG 2.0E 01 LB
MERCURIC THIOCYANATE	2.1E 01 4.5E 01	3.7E 01 8.2E 01	5.5E 01 7.7E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.2E 00	2.1E 01 9.4E 00	1.5E 00 6.9E-01	1.5E 02 6.7E 01	2.1E 01 9.4E 00	4.5E 01 KG 2.0E 01 LB
MERCUROUS NITRATE	1.0E 01 2.1E 01	3.7E 01 8.2E 01	3.1E 01 6.9E 01	2.3E 01 KG 5.0E 01 LB	8.8E 00 1.9E 03	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E 02 6.7E 01	2.0E 01 1.3E 01	4.5E 01 KG 2.0E 01 LB
METHOXYCHLOR (PURE)	2.7E 03 6.0E 03	3.7E 01 8.2E 01	6.6E 00 1.0E 01	1.9E 01 LTR 5.0E 00 GAL	1.1E 01 2.4E 00	1.4E 01 6.0E 00	1.0E 00 4.6E-01	6.7E 01 3.1E 01	1.0E 02 6.7E 01	2.1E 01 LTR 7.8E 01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	INCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	INCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
METHOXYCHLOR (+ETHANE)	2.7E 03 6.0E 03	3.7E 01 8.2E 01	6.8E 00 1.5E 01	1.9E 01 LTN 5.2E 02 GAL	1.1E 01 2.5E 01	2.3E 01 5.1E 01	1.7E 00 7.6E-01	1.1E 02 5.2E 01	1.4E 02 6.9E 01	9.5E 01 LTN 1.3E 02 GAL
ETHYL MERCAPTAN	8.4E 01 1.9E 02	1.1E 02 2.5E 02	7.8E 01 1.6E 02	2.3E 02 KG 5.0E 02 LB	1.1E 01 2.4E 01	2.3E 01 5.2E 01	1.5E 00 6.6E-01	6.1E 03 2.8E 03	7.3E 04 1.2E 04	1.8E 02 KG 4.1E-01 LB
METHYL METHACRYLATE	1.1E 04 2.4E 04	2.2E 04 4.9E 04	1.9E 04 4.1E 04	1.5E 04 LTN 4.2E 03 GAL	9.9E 03 4.3E 04	1.5E 01 9.7E 01	9.2E-01 4.1E-01	3.6E-02 1.5E-02	9.2E-03 4.2E-01	9.9E-03 LTN 3.8E-02 GAL
METHYL PARATHION (DUST)	3.3E 02 7.3E 02	4.1E 02 9.2E 02	5.0E 02 1.1E 03	2.1E 02 LTN 5.5E 01 GAL	1.1E 01 4.3E 01	1.4E 01 4.5E 01	1.2E 00 4.8E-01	2.4E 02 1.1E 02	5.8E-01 2.4E-01	7.2E-01 LTN 2.7E 00 GAL
METHYL PARATHION (+ETHANE)	9.3E 02 7.3E 03	4.1E 02 9.2E 02	5.0E 02 1.1E 03	2.1E 02 LTN 5.5E 01 GAL	1.2E 01 4.3E 01	1.6E 01 7.0E 01	1.2E 00 5.3E-01	4.9E 02 2.2E 02	6.2E-01 3.7E-01	1.4E 02 LTN 5.4E 02 GAL
MALATHION	1.7E 02 2.2E 02	3.7E 01 8.2E 01	1.7E 02 3.9E 02	1.9E 01 LTN 5.0E 02 GAL	1.1E 01 2.4E 01	2.4E 01 1.1E 01	1.7E 00 7.6E-01	5.0E 01 2.4E 01	3.2E 02 1.5E 02	1.0E 01 LTN 4.2E 01 GAL
MOLYBDIC TRIOXIDE	1.0E 00 2.2E 00	2.2E 00 4.9E 00	2.0E 00 4.1E 00	1.5E 00 KG 3.2E 00 LB	9.9E 00 4.3E 01	1.5E 01 9.4E 01	9.1E-01 4.1E-01	1.9E-01 8.7E-02	1.7E-02 7.5E-03	9.4E-02 KG 2.5E-02 LB
DIMETHYLAMINE	1.2E 03 2.9E 03	1.1E 02 2.5E 02	3.2E 03 6.5E 03	2.1E 02 LTN 5.5E 01 GAL	1.1E 01 4.1E 01	1.2E 01 5.1E 01	1.1E 00 5.0E-01	3.7E 00 1.7E 00	1.0E-01 9.4E-02	1.1E 00 LTN 4.1E 00 GAL
TRIMETHYLAMINE	1.9E 03 2.9E 03	1.1E 02 2.5E 02	2.2E 03 4.9E 03	2.1E 02 LTN 5.5E 01 GAL	1.1E 01 4.3E 01	1.6E 01 7.0E 01	1.2E 00 5.3E-01	3.7E 00 1.7E 00	2.1E-01 9.4E-02	1.1E 02 LTN 4.1E 02 GAL
NALED	7.9E 02 1.7E 03	3.7E 01 8.2E 01	1.3E 01 2.9E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 4.3E 01	1.7E 01 7.4E 01	1.2E 00 5.4E-01	2.7E 01 1.2E 01	2.6E 01 1.1E 01	8.2E 03 KG 3.7E 02 LB
NAPHTHALENE	1.8E 02 3.9E 02	3.7E 01 8.2E 01	3.4E 02 6.5E 02	2.3E 01 KG 5.0E 01 LB	1.1E 01 5.1E 01	1.7E 01 7.8E 01	1.2E 00 5.5E-01	7.4E 01 3.4E 01	1.6E 00 7.2E-01	2.3E 01 KG 1.0E 01 LB
NAPHTHENIC ACID	3.1E 02 6.9E 02	3.7E 01 8.2E 01	5.3E 02 1.2E 03	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.4E 01	1.9E 01 8.4E 01	1.3E 00 6.1E-01	1.2E 02 5.1E 01	1.3E 00 5.7E-01	9.4E 01 KG 1.0E 01 LB
NICKEL ACETATE	5.2E 03 1.1E 04	2.2E 04 4.9E 04	8.9E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 01	1.7E 01 7.8E 01	1.2E 00 5.5E-01	1.9E-01 8.7E-02	4.7E-02 2.2E-02	9.4E-02 KG 2.5E-02 LB
NICKEL AMMONIUM SULFATE	7.9E 03 1.8E 04	2.2E 04 4.9E 04	1.3E 04 3.0E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 01	1.6E 01 7.3E 01	1.2E 00 5.2E-01	1.9E-01 8.7E-02	3.3E-02 1.6E-02	9.4E-02 KG 2.5E-02 LB
NICKEL BROMIDE	5.5E 03 1.2E 04	2.2E 04 4.9E 04	9.3E 03 2.0E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 01	1.7E 01 7.6E 01	1.2E 00 5.4E-01	1.9E-01 8.7E-02	4.3E-02 2.0E-02	9.4E-02 KG 2.5E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
NICKEL CHLORIDE	4.4E 03 1.1E 04	2.2E 04 4.9E 04	4.1E 03 1.8E 04	1.5E 04 KG 3.2E 04 LB	1.5E 0. 5.8E 01	1.7E 01 7.5E 01	1.2E 00 5.5E-01	1.9E-01 8.7E-02	5.0E-02 2.3E-02	5.0E-02 KG 2.5E-02 LB
NICKEL FORMATE	3.7E 03 8.2E 03	8.1E 03 9.7E 03	4.3E 03 1.4E 04	2.3E 03 KG 5.0E 03 LB	1.3E 0 5.6E 01	1.7E 01 7.8E 00	1.2E 00 5.5E-01	1.7E 00 4.7E-01	6.6E-02 2.9E-02	3.1E-01 KG 1.4E-01 LB
NICKEL HYDROXIDE	1.9E 03 4.2E 03	4.1E 03 3.7E 03	1.2E 03 7.2E 03	2.3E 03 KG 5.0E 03 LB	4.6E 01 4.6E 01	1.2E 01 5.3E 00	8.4E-01 5.8E-01	6.1E-01 2.8E-01	1.6E-01 4.6E-02	1.0E-01 KG 5.2E-02 LB
NICKEL NITRATE	5.9E 03 1.3E 04	5.6E-01 4.2E-01	1.7E 04 2.2E 03	1.5E 12 2KG 1.5E-33 LM	1.6E 01 7.5E 01	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.3E 23 5.7E 22	6.2E-02 1.8E-02	8.1E-34 2KG 1.3E-33 LB
NICKEL SULFATE	5.9E 03 1.3E 04	2.2E 04 4.9E 04	4.9E 03 2.7E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 5.7E 01	1.7E 01 7.6E 00	1.2E 00 5.4E-01	1.9E-01 8.7E-02	4.5E-02 2.0E-02	5.0E-02 KG 2.5E-02 LB
NITRIC ACID	3.5E 03 7.7E 03	4.1E 03 3.2E 03	5.9E 03 1.3E 04	2.1E 03 LTR 5.5E 02 GAL	9.4E 01 4.5E 01	1.3E 01 6.0E 00	9.4E-01 4.3E-01	4.9E-01 2.2E-01	9.2E-02 4.2E-02	1.4E-01 LTR 6.4E-01 GAL
NITROBENZENE	6.6E 03 1.5E 04	2.2E 04 4.9E 04	1.1E 04 2.5E 04	1.5E 04 LTR 4.0E 03 GAL	1.1E 0 5.0E 01	1.5E 01 6.7E 00	1.0E 00 4.8E-01	1.9E-01 8.7E-02	6.0E-02 2.7E-02	1.6E-02 LTR 2.1E-01 GAL
NITROGEN DIOXIDE	2.5E 03 5.6E 03	4.1E 03 2.7E 03	4.3E 03 9.5E 03	2.3E 03 KG 5.0E 03 LB	1.2E 0 4.9E 01	1.3E 01 6.0E 00	9.5E-01 4.3E-01	4.9E-01 2.2E-01	1.3E-01 5.8E-02	1.4E-01 KG 6.5E-02 LB
NITROPHENOL	2.0E 03 4.5E 03	4.1E 02 1.7E 02	5.4E 03 7.4E 03	2.3E 02 KG 5.0E 02 LB	1.5E 0 6.1E 01	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.1E 01 5.0E 00	1.9E-01 8.6E-02	3.2E 00 KG 1.5E 00 LB
PARAFORMALDEHYDE	1.1E 03 2.4E 03	4.1E 03 4.7E 03	1.9E 03 8.1E 03	2.1E 03 LTR 5.5E 02 GAL	1.2E 0 5.5E 01	1.4E 01 6.4E 00	1.2E 00 5.5E-01	4.9E-01 2.2E-01	2.5E-01 1.1E-01	1.4E-01 LTR 6.4E-01 GAL
PARATHION (PURE)	3.1E 01 6.9E 01	5.7E 01 9.4E 01	5.3E 01 1.2E 02	1.9E 01 LTR 5.0E 00 GAL	1.4E 01 6.5E 01	1.9E 01 8.7E 00	1.4E 00 6.2E-01	6.7E 01 3.1E 01	6.9E 00 4.1E 00	2.1E 01 LTR 7.8E 01 GAL
PARATHION (WETTABLE)	3.1E 01 6.9E 01	5.7E 01 8.2E 01	5.3E 01 1.2E 02	1.9E 01 LTR 5.0E 00 GAL	1.3E 01 7.0E 01	2.3E 01 1.0E 01	1.6E 00 7.4E-01	1.1E 02 5.2E 01	1.3E 01 5.7E 00	3.5E 01 LTR 1.3E 02 GAL
PENTACHLOROPHENOL	2.0E 02 4.5E 02	5.7E 01 8.2E 01	5.7E 02 8.2E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.1E 01	1.8E 01 8.1E 00	1.3E 00 5.8E-01	7.4E 01 3.4E 01	1.9E 00 5.6E-01	2.9E 01 KG 1.3E 01 LB
PHENOL	5.3E 02 1.2E 03	4.1E 02 4.2E 02	8.9E 02 2.0E 03	2.3E 02 KG 5.0E 02 LB	1.1E 01 5.1E 01	1.5E 01 6.8E 00	1.1E 00 4.9E-01	4.1E 00 2.0E 00	5.1E-01 2.3E-01	1.0E 00 KG 4.1E-01 LB
PHOSGENE	2.7E 03 6.2E 03	4.1E 03 9.4E 03	4.6E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.6E 01	1.3E 01 6.1E 00	9.6E-01 4.4E-01	4.9E-01 2.2E-01	9.9E-02 4.5E-02	1.4E-01 KG 6.5E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PHOSPHORIC ACID	4.0E 03 1.9E 04	2.2E 04 4.9E 04	1.5E 04 3.3E 04	1.5E 04 KG 3.2E 04 LB	9.5E 00 4.3E 01	1.3E 01 5.8E 01	9.1E-01 4.1E-01	9.8E-02 4.1E-02	3.7E-02 1.7E-02	2.6E-02 KG 1.2E-02 LB
PHOSPHORUS	2.3E 00 5.1E 00	3.7E 01 8.2E 01	3.9E 00 8.7E 00	2.3E 01 KG 5.0E 01 LB	1.6E 01 6.2E 01	1.8E 01 8.3E 01	1.3E 00 5.9E-01	2.7E 01 1.2E 01	6.2E 01 3.7E 01	4.2E 01 KG 3.7E 01 LB
PHOSPHORUS OXYCHLORIDE	2.0E 03 4.3E 03	4.1E 03 9.0E 03	4.7E 03 1.0E 04	2.5E 03 KG 5.6E 03 LB	1.0E 01 4.5E 01	1.3E 01 6.0E 01	9.5E-01 4.3E-01	6.9E-01 2.2E-01	9.7E-02 4.6E-02	1.6E-01 KG 6.5E-02 LB
PHOSPHORUS PENTAFLUORIDE	1.0E 02 3.9E 02	6.1E 02 9.0E 02	3.9E 02 6.5E 02	2.3E 02 KG 5.0E 02 LB	1.0E 01 4.7E 00	1.4E 01 6.2E 00	9.7E-01 4.4E-01	6.9E 00 2.2E 00	1.6E 00 7.2E-01	1.0E 00 KG 6.5E-01 LB
PHOSPHORUS PENTACHLORIDE	2.0E 03 5.3E 03	4.1E 03 9.0E 03	4.1E 03 9.0E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.6E-01 4.0E-01	6.9E-01 2.2E-01	1.1E-01 5.1E-02	1.6E-01 KG 6.5E-02 LB
PHOSPHORUS TRICHLORIDE	2.5E 03 5.5E 03	4.1E 03 9.0E 03	4.3E 03 9.5E 03	2.5E 03 KG 5.0E 03 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.6E-01 4.0E-01	6.9E-01 2.2E-01	1.1E-01 4.8E-02	1.6E-01 KG 6.5E-02 LB
POLYCHLORINATED BIPHENYLS	1.2E 01 2.7E 01	3.7E 01 8.2E 01	2.1E 01 4.5E 01	1.9E 01 LTR 5.0E 00 GAL	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	1.5E 02 6.7E 01	3.6E 01 1.6E 01	4.5E 01 LTR 1.7E 02 GAL
POTASSIUM ARSENATE	5.7E 02 1.3E 03	5.7E 01 1.2E 02	9.7E 02 2.1E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.8E 00	2.0E 01 9.0E 00	1.4E 00 6.3E-01	1.2E 02 5.5E 01	4.2E-01 1.9E-01	3.9E 01 KG 1.7E 01 LB
POTASSIUM ARSENITE	1.3E 03 3.1E 03	3.7E 01 8.2E 01	2.5E 03 5.6E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.3E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.2E 02 5.5E 01	1.6E-01 7.2E-02	3.7E 01 KG 1.7E 01 LB
POTASSIUM BICHROMATE	5.0E 03 1.1E 04	2.2E 04 4.9E 04	9.9E 03 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.9E-01 8.7E-02	4.0E-02 2.1E-02	5.0E-02 KG 2.5E-02 LB
POTASSIUM CHROMATE	7.0E 03 1.5E 04	2.2E 04 4.9E 04	1.3E 04 2.9E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	1.9E-01 8.7E-02	3.8E-02 1.7E-02	5.0E-02 KG 2.5E-02 LB
POTASSIUM CYANIDE	1.9E 01 4.2E 01	3.7E 01 8.2E 01	3.2E 01 7.0E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.0E-01	5.4E 01 2.4E 01	1.4E 01 6.5E 00	1.0E 01 KG 7.4E 00 LB
POTASSIUM HYDROXIDE	3.5E 03 7.7E 03	4.1E 03 9.0E 03	5.9E 03 1.3E 04	2.3E 03 KG 5.0E 03 LB	9.9E 00 4.5E 00	1.3E 01 6.0E 00	9.4E-01 4.3E-01	6.9E-01 2.2E-01	7.7E-02 3.5E-02	1.0E-01 KG 6.5E-02 LB
POTASSIUM PERMANGANATE	1.9E 02 4.1E 02	6.1E 02 9.0E 02	3.1E 02 6.9E 02	2.3E 02 KG 5.0E 02 LB	1.4E 01 6.3E 00	1.9E 01 8.6E 00	1.3E 00 6.0E-01	1.0E 01 4.7E 00	1.5E 00 6.8E-01	1.1E 00 KG 1.4E 00 LB
PROPIONIC ACID	4.5E 03 1.0E 04	2.2E 04 4.9E 04	1.4E 04 3.1E 04	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 4.9E 00	1.4E 01 6.0E 00	1.0E 00 4.7E-01	1.1E-01 5.1E-02	3.9E-02 1.8E-02	3.3E-02 LTR 1.2E-01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PROPIONIC ANHYDRIDE	7.7E 03 1.6E 04	2.2E 04 4.9E 04	1.2E 04 2.7E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.4E 00	1.5E 01 6.6E 00	1.6E 00 4.7E-01	1.1E-01 5.1E-02	6.3E-02 2.8E-02	3.5E-02 KG 1.5E-02 LB
PROPYL ALCOHOL	1.5E 04 3.3E 04	2.2E 04 4.9E 04	2.0E 04 4.7E 04	1.5E 04 LTR 4.0E 03 GAL	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	6.7E-02 3.1E-02	2.1E-02 9.6E-03	2.0E-02 LTR 7.5E-02 GAL
PYRETHRINS (PURE)	5.2E 03 7.2E 03	6.1E 03 9.0E 03	5.5E 03 1.2E 04	2.1E 03 LTR 5.5E 02 GAL	8.4E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	6.1E-01 2.8E-01	5.9E-02 2.7E-02	1.8E-01 LTR 6.8E-01 GAL
PYRETHRINS (EMULSIFIABLE)	5.2E 03 7.2E 03	6.1E 03 9.0E 03	5.5E 03 1.2E 04	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 6.0E 00	1.8E 01 8.2E 00	1.3E 00 5.7E-01	1.8E 00 8.7E-01	8.3E-02 3.8E-02	3.1E-01 LTR 1.2E 00 GAL
PYROGALLIC ACID	7.9E 02 1.7E 03	9.1E 02 9.0E 02	1.3E 03 2.9E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.7E 00	2.2E 01 9.8E 00	1.4E 00 6.4E-01	1.1E 01 5.3E 00	5.0E-01 2.3E-01	5.2E 00 KG 1.9E 00 LB
QUINOLINE	2.2E 02 4.9E 02	5.7E 01 9.2E 01	3.7E 02 8.2E 02	1.9E 01 LTR 5.0E 00 GAL	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	8.7E 01 5.1E 01	1.2E 00 5.0E-01	2.1E 01 LTR 7.8E 01 GAL
RESORCINOL	1.5E 03 3.4E 03	9.1E 02 9.3E 02	2.0E 03 5.7E 03	2.3E 02 KG 5.2E 02 LB	9.6E 00 4.5E 00	1.3E 01 5.9E 00	9.3E-01 4.2E-01	6.9E 00 2.2E 00	1.2E-01 5.7E-02	1.4E 00 KG 6.5E-01 LB
SELENIC ACID	1.1E 03 2.5E 03	3.7E 01 8.2E 01	1.9E 03 4.3E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	8.1E 01 3.7E 01	2.4E-01 1.1E-01	2.5E 01 KG 1.1E 01 LB
SELENIUM OXIDE	5.5E 02 1.2E 03	3.7E 01 8.2E 01	8.9E 02 2.0E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	8.1E 01 3.7E 01	5.1E-01 2.3E-01	2.5E 01 KG 1.1E 01 LB
SODIUM (PURE)	2.9E 02 6.5E 02	4.1E 02 9.0E 02	5.0E 02 1.1E 03	2.3E 02 KG 5.0E 02 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	8.1E 00 2.8E 00	6.5E-01 1.0E-01	1.9E 00 KG 8.1E-01 LB
SODIUM (EMULSIFIABLE)	2.9E 02 6.5E 02	4.1E 02 9.0E 02	5.0E 02 1.1E 03	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.6E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	1.0E 01 4.7E 00	9.2E-01 4.2E-01	3.1E 00 KG 1.4E 00 LB
SODIUM	2.5E 03 5.5E 03	4.1E 03 9.0E 03	4.2E 03 9.3E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	6.1E-01 2.8E-01	1.1E-01 4.9E-02	1.8E-01 KG 8.2E-02 LB
SODIUM ARSENATE	1.0E 03 2.2E 03	3.7E 01 8.2E 01	2.1E 03 4.6E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.2E 02 5.5E 01	2.2E-01 1.0E-01	3.7E 01 KG 1.7E 01 LB
SODIUM ARSENITE	1.9E 03 3.4E 03	3.7E 01 8.2E 01	2.0E 03 9.7E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.2E 02 5.5E 01	1.0E-01 8.0E-02	3.7E 01 KG 1.7E 01 LB
SODIUM BICHROMATE	9.4E 03 2.1E 04	2.4E 04 4.9E 04	1.0E 04 3.5E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.2E 00	1.5E 01 6.9E 00	1.1E 00 5.0E-01	1.9E-01 8.7E-02	2.9E-02 1.3E-02	9.0E-02 KG 2.9E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
SODIUM BIFLUORIDE	2,2E 02 4,9E 02	4,1E 02 9,0E 02	3,7E 02 8,2E 02	2,3E 02 KG 5,0E 02 LB	1,5E 01 3,4E 01	2,1E 01 9,4E 00	1,3E 01 6,7E-01	1,0E 01 4,7E 00	1,2E 00 5,6E-01	3,1E 00 KG 1,4E 00 LB
SODIUM BISULFITE	1,1E 03 2,3E 03	2,2E 03 4,9E 03	1,0E 03 3,9E 03	1,5E 03 KG 3,2E 03 LB	1,1E 01 5,0E 01	1,5E 01 6,7E 00	1,0E 00 4,8E-01	9,0E-02 4,1E-02	2,0E-02 1,2E-02	2,0E-02 KG 1,2E-02 LB
SODIUM CHROMATE	1,3E 04 2,9E 04	2,0E 04 4,4E 04	2,2E 04 4,9E 04	1,5E 04 KG 3,2E 04 LB	1,0E 01 4,7E 00	1,4E 01 6,3E 00	9,0E-01 4,5E-01	1,9E-01 8,7E-02	2,0E-02 9,3E-03	9,0E-02 KG 4,5E-02 LB
SODIUM CYANIDE	6,0E 00 1,3E 01	3,7E 01 8,2E 01	1,1E 01 2,5E 01	2,3E 01 KG 5,0E 01 LB	1,3E 01 5,4E 00	1,7E 01 7,9E 00	1,2E 00 5,7E-01	5,4E 01 2,4E 01	4,1E 01 1,9E 01	1,0E 01 KG 7,4E 00 LB
SODIUM DICHLORO-ISO-SULFONATE	8,3E 02 1,8E 03	4,1E 03 9,0E 03	1,4E 03 3,1E 03	2,3E 03 KG 5,0E 03 LB	1,2E 01 5,3E 00	1,0E 01 7,0E 00	1,2E 00 5,3E-01	4,9E-01 2,2E-01	3,2E-01 1,5E-01	1,0E-01 KG 4,5E-02 LB
SODIUM FLUORIDE	2,9E 02 6,3E 02	4,1E 02 9,0E 02	5,0E 02 1,1E 03	2,3E 02 KG 5,0E 02 LB	1,5E 01 6,9E 00	2,0E 01 9,2E 00	1,4E 00 6,6E-01	1,9E 01 8,7E 00	9,2E-01 4,2E-01	3,1E 00 KG 1,4E 00 LB
SODIUM HYDRO-SULFIDE	4,0E 02 8,7E 02	4,1E 03 9,0E 03	7,4E 02 1,6E 03	2,3E 03 KG 5,0E 03 LB	1,5E 01 6,9E 00	2,0E 01 9,1E 00	1,4E 00 6,5E-01	6,9E-01 2,2E-01	6,1E-01 2,8E-01	1,4E-01 KG 6,5E-02 LB
SODIUM HYDRAZINE	4,3E 03 9,5E 03	4,1E 03 9,0E 03	7,4E 03 1,6E 04	2,3E 03 KG 5,0E 03 LB	1,0E 01 4,7E 00	1,4E 01 6,2E 00	9,7E-01 4,4E-01	4,9E-01 2,2E-01	6,2E-02 2,8E-02	1,4E-01 KG 6,5E-02 LB
SODIUM HYPOCHLORITE	9,2E 00 2,0E 01	3,7E 01 8,2E 01	1,0E 01 3,4E 01	2,3E 01 KG 5,0E 01 LB	1,1E 01 5,0E 00	1,9E 01 8,6E 00	1,0E 00 4,7E-01	6,7E 01 3,1E 01	3,9E 01 1,3E 01	2,1E 01 KG 9,3E 00 LB
SODIUM METHYLATE	5,3E 03 1,1E 04	2,2E 04 4,9E 04	1,2E 04 2,7E 04	1,5E 04 KG 3,2E 04 LB	1,2E 01 5,0E 00	1,6E 01 7,5E 00	1,2E 00 5,3E-01	1,1E-01 5,1E-02	4,0E-02 2,1E-02	3,3E-02 KG 1,5E-02 LB
SODIUM NITRITE	3,3E 02 7,3E 02	4,1E 02 9,0E 02	5,9E 02 1,3E 03	2,3E 02 KG 5,0E 02 LB	1,0E 01 4,4E 00	2,1E 01 9,4E 00	1,5E 00 6,7E-01	4,9E 00 2,2E 00	8,2E-01 3,7E-01	1,4E 00 KG 6,5E-01 LB
SODIUM PHOSPHATE MONOBASIC	3,2E 04 7,0E 04	2,2E 04 4,9E 04	5,4E 04 1,2E 05	1,5E 04 KG 3,2E 04 LB	8,8E 00 4,0E 00	1,2E 01 5,3E 00	8,4E-01 3,9E-01	9,0E-02 4,1E-02	8,5E-03 3,9E-03	2,0E-02 KG 1,2E-02 LB
SODIUM PHOSPHATE DIBASIC	1,9E 04 4,1E 04	2,2E 04 4,9E 04	3,2E 04 7,0E 04	1,5E 04 KG 3,2E 04 LB	9,4E 00 4,3E 00	1,3E 01 5,7E 00	9,0E-01 4,1E-01	9,0E-02 4,1E-02	1,5E-02 6,8E-03	2,0E-02 KG 1,2E-02 LB
SODIUM PHOSPHATE TRIBASIC	6,0E 03 1,3E 04	2,2E 04 4,9E 04	1,1E 04 2,5E 04	1,5E 04 KG 3,2E 04 LB	1,2E 01 5,3E 00	1,0E 01 7,1E 00	1,1E 00 5,2E-01	9,0E-02 4,1E-02	4,1E-02 1,8E-02	2,0E-02 KG 1,2E-02 LB
SODIUM SELENITE	2,0E 03 9,3E 03	3,7E 01 8,2E 01	4,1E 03 9,0E 03	2,3E 01 KG 5,0E 01 LB	1,0E 01 6,2E 00	1,0E 01 8,2E 00	1,3E 00 9,9E-01	8,1E 01 3,7E 01	1,1E-01 5,1E-02	2,5E 01 KG 1,1E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
SODIUM SULFIDE	2.7E 03 5.9E 03	4.1E 03 9.0E 03	4.5E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.0E 01	1.8E 01 3.9E 01	1.3E 00 2.9E-01	4.9E-01 2.2E-01	1.2E-01 4.9E-02	1.4E-01 KG 6.3E-02 LB
STRONTIUM CHROMATE	7.9E 03 1.7E 04	2.2E 04 4.9E 04	1.3E 04 2.9E 04	1.3E 04 KG 2.9E 04 LB	1.2E 01 2.7E 01	1.4E 01 3.1E 01	9.9E-01 4.5E-01	1.1E-01 5.1E-02	2.6E-02 1.1E-02	3.3E-02 KG 1.5E-02 LB
STRYCHNINE	1.2E 03 2.7E 03	4.1E 02 9.0E 02	2.1E 03 4.6E 03	2.3E 02 KG 5.0E 02 LB	1.1E 01 2.5E 01	1.5E 01 3.3E 01	1.1E 00 4.9E-01	9.1E 00 2.0E 00	1.6E-01 7.1E 02	1.8E 00 KG 8.1E-01 LB
STYRENE	8.7E 02 2.1E 03	4.1E 03 9.1E 03	1.9E 03 3.9E 03	2.1E 03 LTR 5.5E 02 GAL	1.0E 01 2.3E 01	1.4E 01 3.1E 01	9.9E-01 4.5E-01	1.8E-01 8.3E-02	1.8E-01 4.7E-02	9.4E-02 LTR 2.6E-01 GAL
SULFURIC ACID	5.4E 03 1.2I 04	4.1E 03 9.1E 03	9.1E 03 2.0E 04	2.3E 03 KG 5.2E 03 LB	9.1E 00 2.0E 01	1.3E 01 2.9E 01	9.3E-01 4.2F-01	4.9E-01 2.2E-01	9.8F-02 2.7E-02	1.0E-01 KG 4.5E-02 LB
SULFUR MONOCHLORIDE	5.4E 03 8.3E 03	4.1E 03 9.1F 03	6.4E 03 1.4E 04	2.3E 03 KG 5.0E 03 LB	9.4E 00 2.0E 01	1.3E 01 2.9E 01	9.4E-01 4.3E-01	9.1E-01 2.0E-01	7.1E-02 3.2E-02	1.0E-01 KG 4.2F-02 LB
2,4,5-T ACID (ESTER)	4.9E 02 1.1E 03	4.1E 02 9.0E 02	8.2E 02 1.8E 03	2.3E 02 KG 5.2E 02 LB	1.1E 01 2.5E 01	1.5E 01 3.3E 01	1.0E 00 4.9E-01	2.4E 00 1.1E 00	4.2E-01 1.8E-01	7.2E-01 KG 3.3E-01 LB
2,4,5-T ACID (SALTABLE)	4.9E 02 1.1E 03	4.1E 02 9.1F 02	8.2E 02 1.8F 03	2.3F 02 KG 5.2E 02 LB	1.2E 01 2.7E 01	1.7E 01 3.9E 01	1.2E 00 5.4E-01	4.9E 00 2.2E 00	5.6E-01 2.5E-01	1.4E 00 KG 6.3E-01 LB
2,4,5-T ESTERS (PURE)	7.3E 02 1.6E 03	4.1E 03 9.1E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.2E 03 LB	1.1E 01 2.5E 01	1.5E 01 3.3E 01	1.0E 00 4.7E-01	2.4E-01 1.1E-01	2.6E-01 1.2E-01	7.2E-02 KG 1.3E-02 LB
2,4,5-T ESTERS (SALTABLE)	7.5E 02 1.6E 03	4.1E 03 9.1E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.2E 03 LB	1.3E 01 2.9E 01	1.7E 01 3.9E 01	1.2E 00 5.5E-01	4.9E-01 2.2E-01	3.6E-01 1.6E-01	1.4E-01 KG 6.3E-02 LB
TANNIC ACID	1.8E 03 3.9E 03	4.1E 03 9.0E 03	2.9E 03 6.1E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.0E 01	1.9E 01 4.2E 01	1.3E 00 6.1E-01	1.2E 00 5.6E-01	1.7E-01 7.6E-02	3.6E-01 KG 1.6E-01 LB
2,4,5-TP ACID (PURE)	1.4E 03 4.1E 03	5.7E 01 4.0E 01	5.1E 02 4.9E 02	2.3E 01 KG 5.2E 01 LB	1.6E 01 3.5E 01	2.2E 01 4.9E 01	1.6E 00 7.1F-01	1.5E 02 6.7E 01	1.5E 02 6.9E 01	4.5E 01 KG 2.0E 01 LB
2,4,5-TP ACID (SALTABLE)	1.9E 03 4.1E 03	5.7E 01 8.2E 01	5.1E 02 6.3E 02	2.3E 01 KG 5.2E 01 LB	1.9E 01 4.2E 01	2.3E 01 5.1E 01	1.7E 00 7.6E-01	2.4E 02 1.1E 02	2.1E 02 9.7E 01	7.2E 01 KG 3.3E 01 LB
TETRAETHYL LEAD	8.8E 02 1.9E 03	3.7E 01 8.2E 01	1.9E 01 3.3E 01	1.9E 01 LTR 5.2E 00 GAL	2.1E 01 4.7E 01	2.9E 01 6.3E 01	2.0E 00 9.2E-01	5.2E 01 2.3E 01	2.1E 01 7.8E 01	2.1E 01 LTR 7.8E 01 GAL
TETRAETHYL PYROPHOSPHATE	3.7E 01 8.1E 01	3.7E 01 8.2E 01	8.2E 01 1.4E 02	1.9E 01 LTR 5.0E 00 GAL	1.1E 01 4.9E 01	1.4E 01 6.6E 00	1.0E 00 4.7E-01	6.7E 01 3.1E 01	8.8E 00 4.0E 00	2.1E 01 LTR 7.8E 01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
TOLUENE	1.1E 03 2.5E 03	4.1E 03 9.0E 03	1.4E 03 3.1E 03	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 2.6E 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	1.6E-01 4.3E-02	1.6E-01 8.3E-02	9.6E-02 LTR 2.1E-01 GAL
TRIBROMENE (RUHF)	1.9E-01 3.4E-01	3.7E 01 6.8E 01	2.6E-01 9.7E-01	2.3E 01 KG 9.9E 01 LB	1.6E 01 3.6E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	4.7E 01 3.1E 01	2.9E 03 1.3E 03	2.1E 01 KG 9.1E 00 LB
TRIBROMENE (METHANOL)	1.3E-01 3.3E-01	3.7E 01 8.2E 01	2.6E-01 9.7E-01	2.3E 01 KG 9.9E 01 LB	1.6E 01 3.6E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	1.1E 02 9.2E 01	6.3E 03 1.0E 03	9.9E 01 KG 1.4E 01 LB
TRICHLOROFORM	7.9E 03 1.7E 04	2.2E 04 4.9E 04	1.5E 04 2.9E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 2.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	1.9E-01 8.7E-02	5.0E-02 2.3E-02	5.0E-02 KG 2.2E-02 LB
TRICHLOROETHANOL	2.4E 03 5.3E 03	6.7E 03 1.2E 04	7.2E 02 1.6E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.4E 00	2.3E 01 1.2E 01	1.4E 00 6.6E-01	2.7E 01 1.2E 01	6.6E 01 2.7E 01	9.2E 00 KG 3.7E 00 LB
TRIETHANOLAMINE HYDROCHLORIDE	9.7E 02 2.1E 03	4.1E 03 9.0E 03	1.4E 03 3.0E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.6E 00	1.4E 01 7.0E 00	1.2E 00 5.5E-01	4.9E-01 2.2E-01	2.4E-01 1.1E-01	1.4E-01 KG 6.5E-02 LB
TRIETHYLAMINE	5.5E 03 7.7E 03	4.1E 03 9.0E 03	5.9E 03 1.3E 04	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 00	1.8E 01 8.3E 00	1.3E 00 6.0E-01	3.7E-01 1.7E-01	9.2E-02 4.2E-02	1.1E-01 KG 4.9E-02 LB
TRIMETHYLAMINE	2.1E 03 4.6E 03	4.1E 03 9.0E 03	1.6E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.6E 00	1.6E 01 7.3E 00	1.2E 00 5.2E-01	3.7E-01 1.7E-01	1.3E-01 6.0E-02	1.1E-01 KG 4.9E-02 LB
URANIUM PEROXIDE	6.7E 03 1.7E 04	2.2E 04 4.9E 04	9.2E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 2.0E 00	1.2E 01 5.5E 00	8.4E-01 3.8E-01	1.1E-01 5.1E-02	4.7E-02 1.8E-02	3.3E-02 KG 1.5E-02 LB
URANYL ACETATE	7.0E 03 1.7E 04	2.2E 04 4.9E 04	1.3E 04 2.9E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 2.6E 00	1.5E 01 7.2E 00	1.1E 00 5.0E-01	1.9E-01 8.7E-02	5.2E-02 1.4E-02	5.0E-02 KG 2.5E-02 LB
URANYL NITRATE	6.5E 03 1.4E 04	2.2E 04 4.9E 04	1.1E 04 2.4E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 2.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.9E-01 8.7E-02	9.6E-02 1.6E-02	5.0E-02 KG 2.5E-02 LB
URANYL SULFATE	9.9E 03 1.3E 04	2.2E 04 4.9E 04	1.0E 04 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 2.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.9E-01 8.7E-02	4.2E-02 1.8E-02	5.0E-02 KG 2.5E-02 LB
VANADIUM OXYTRICHLORIDE	4.6E 03 1.0E 04	2.2E 04 4.9E 04	7.7E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.3E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	1.1E-01 5.1E-02	4.2E-02 1.9E-02	3.3E-02 KG 1.5E-02 LB
VANADIUM PENTOXIDE	2.0E 03 5.3E 03	4.1E 03 9.2E 03	4.1E 03 9.2E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.0E 00 4.7E-01	9.8E-02 4.5E-02	3.1E-01 KG 1.4E-01 LB
VANADYL SULFATE	2.0E 03 5.3E 03	4.1E 03 9.2E 03	4.1E 03 9.2E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 3.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.0E 00 4.7E-01	9.8E-02 4.5E-02	3.1E-01 KG 1.4E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
VINYL ACETATE	7.9E 02 1.7E 03	4.1E 03 9.0E 03	1.9E 03 2.9E 03	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 2.7E 00	1.7E 01 3.6E 00	1.2E 00 5.6E-01	9.1E-01 2.8E-01	3.5E-01 1.0E-01	1.0E-01 LTR 3.8E-01 GAL
XYLENE	9.7E 02 2.1E 03	4.1E 03 9.0E 03	1.0E 03 3.0E 03	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 2.9E 00	1.7E 01 3.9E 00	1.2E 00 5.7E-01	3.7E-01 1.7E-01	3.0E-01 1.0E-01	1.1E-01 LTR 4.1E-01 GAL
XYLENOL	1.0E 03 3.5E 03	4.1E 03 9.0E 03	2.7E 03 5.9E 03	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 2.5E 00	1.0E 01 3.3E 00	1.2E 00 5.2E-01	4.9E-01 2.2E-01	1.7E-01 7.8E-02	1.4E-01 LTR 5.4E-01 GAL
ZECTRAN (PURE)	4.9E 02 1.1E 03	4.1E 03 9.0E 03	8.3E 02 1.9E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.5E 00	1.0E 01 3.3E 00	1.1E 00 5.2E-01	4.1E-01 2.0E-01	1.9E-01 1.9E-01	1.8E-01 KG 4.2E-02 LB
ZECTRAN (+ETTAPLE)	4.9E 02 1.1E 03	4.1E 03 9.0E 03	8.3E 02 1.0E 03	2.3E 03 KG 5.2E 03 LB	1.4E 01 2.9E 00	1.9E 01 4.7E 00	1.4E 00 6.2E-01	1.0E 00 4.7E-01	3.5E-01 2.5E-01	3.1E-01 KG 1.0E-01 LB
ZINC ACETATE	1.0E 03 2.1E 03	4.1E 03 9.0E 03	3.1E 03 6.9E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 2.3E 00	1.9E 01 4.4E 00	1.3E 00 6.6E-01	1.0E 00 4.7E-01	1.3E-01 5.8E-02	3.1E-01 KG 1.4E-01 LB
ZINC AMMONIUM CHLORIDE	1.0E 03 2.2E 03	4.1E 03 9.0E 03	2.8E 03 6.1E 03	2.3E 03 KG 5.0E 03 LB	8.8E 00 2.0E 00	1.2E 01 2.7E 00	9.4E-01 3.9E-01	1.7E 00 4.7E-01	1.5E-01 6.6E-02	3.1E-01 KG 1.4E-01 LB
ZINC BICHROMATE	2.0E 03 4.2E 03	4.1E 03 9.0E 03	4.8E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.5E 00	1.6E 01 3.4E 00	1.2E 00 5.3E-01	6.1E-01 2.8E-01	9.4E-02 3.8E-02	1.0E-01 KG 8.2E-02 LB
ZINC BORATE	1.1E 03 2.3E 03	4.1E 03 9.0E 03	1.8E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.0E 00	1.9E 01 4.1E 00	1.4E 00 6.2E-01	1.0E 00 4.7E-01	2.5E-01 1.0E-01	3.1E-01 KG 1.0E-01 LB
ZINC BROMIDE	1.9E 03 4.2E 03	4.1E 03 9.0E 03	3.2E 03 7.0E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.6E 00	2.0E 01 4.2E 00	1.4E 00 6.2E-01	1.0E 00 4.7E-01	1.3E-01 5.7E-02	3.1E-01 KG 1.4E-01 LB
ZINC CARBONATE	1.1E 03 2.3E 03	4.1E 03 9.0E 03	1.8E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	8.8E 00 2.0E 00	1.2E 01 2.7E 00	8.4E-01 3.8E-01	1.1E-01 2.8E-01	1.0E-01 9.3E-02	1.8E-01 KG 8.2E-02 LB
ZINC CHLORIDE	1.1E 03 2.3E 03	4.1E 03 9.0E 03	1.9E 03 4.3E 03	2.1E 03 KG 5.0E 03 LB	1.5E 01 3.2E 00	2.3E 01 4.9E 00	1.4E 00 6.3E-01	1.0E 00 4.7E-01	2.1E-01 9.6E-02	3.1E-01 KG 1.0E-01 LB
ZINC CYANIDE	7.9E 02 1.7E 03	3.7E 03 8.2E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.0E 00	1.9E 01 4.7E 00	1.4E 00 6.2E-01	5.4E 01 2.4E 01	2.0E 01 1.1E 01	1.9E 01 KG 7.9E 00 LB
ZINC FLOURIDE	9.1E 02 1.9E 03	4.1E 03 9.0E 03	1.8E 03 2.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.0E 00	1.9E 01 4.1E 00	1.4E 00 6.3E-01	1.0E 00 4.7E-01	3.9E-01 1.8E-01	3.1E-01 KG 1.0E-01 LB
ZINC FORMATE	1.3E 03 2.9E 03	4.1E 03 9.0E 03	2.2E 03 4.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.0E 00	1.9E 01 4.5E 00	1.3E 00 6.1E-01	1.0E 00 4.7E-01	1.8E-01 8.2E-02	3.1E-01 KG 1.0E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR LAKES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHAI (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ZINC HYDROSULFITE	1.7E 03 3.7E 03	4.1E 03 9.0E 03	2.4E 03 6.2E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 01	1.8E 01 4.1E 01	1.3E 00 3.0E+01	1.0E 00 4.7E-01	1.4E-01 3.5E-02	3.1E-01 KG 1.4E-01 LB
ZINC NITRATE	2.9E 03 6.3E 03	4.1E 03 9.0E 03	4.2E 03 9.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 01	1.8E 01 4.1E 01	1.3E 00 3.0E+01	1.0E 00 4.7E-01	9.5E-02 4.3E-02	3.1E-01 KG 1.4E-01 LB
ZINC PERMANGANATE	3.3E 03 7.2E 03	4.1E 03 9.0E 03	9.9E 03 1.3E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.9E 01	1.7E 01 3.9E 01	1.2E 00 2.8E+01	1.0E 00 4.7E-01	9.0E-02 4.1E-02	3.1E-01 KG 1.4E-01 LB
ZINC P-PHENOL-SULFONATE	8.7E 03 1.9E 04	2.0E 04 4.4E 04	8.0E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 2.8E 01	1.7E 01 3.8E 01	1.2E 00 2.7E+01	1.9E-01 8.7E-02	5.3E-02 2.3E-02	5.6E-02 KG 2.5E-02 LB
ZINC PHOSPHIDE	7.5E 02 1.6E 03	4.1E 03 9.0E 03	1.3E 03 2.8E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.8E 01	1.8E 01 4.0E 01	1.3E 00 2.9E+01	6.1E-01 2.8E-01	2.6E-01 1.2E-01	1.8E-01 KG 8.2E-02 LB
ZINC POTASSIUM CHROMATE	9.2E 03 2.0E 04	4.1E 03 9.0E 03	9.4E 03 1.2E 04	2.3E 03 KG 5.0E 03 LB	1.1E 01 2.5E 01	1.5E 01 3.4E 01	1.1E 00 2.5E+01	9.1E-01 2.8E-01	6.1E-02 2.8E-02	1.8E-01 KG 8.2E-02 LB
ZINC PROPIONATE	1.8E 03 4.0E 03	4.1E 03 9.0E 03	3.7E 03 6.7E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 01	1.9E 01 4.3E 01	1.3E 00 3.0E+01	1.0E 00 4.7E-01	1.3E-01 6.0E-02	3.1E-01 KG 1.4E-01 LB
ZINC SILICOFLUORIDE	2.7E 03 6.0E 03	4.1E 03 9.0E 03	4.5E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.9E 01	1.8E 01 4.1E 01	1.3E 00 2.9E+01	1.0E 00 4.7E-01	8.9E-02 4.0E-02	3.1E-01 KG 1.4E-01 LB
ZINC SULFATE	2.4E 03 5.3E 03	4.1E 03 9.0E 03	4.1E 03 9.0E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 01	1.9E 01 4.3E 01	1.3E 00 3.0E+01	1.0E 00 4.7E-01	9.6E-02 4.3E-02	3.1E-01 KG 1.4E-01 LB
ZIRCONIUM ACETATE	1.9E 04 4.2E 04	2.0E 04 4.4E 04	2.3E 04 5.0E 04	1.5E 04 KG 3.2E 04 LB	1.0E 01 2.3E 01	1.4E 01 3.2E 01	9.6E-01 2.2E+01	1.9E-01 8.7E-02	1.0E-02 4.6E-03	5.6E-02 KG 2.5E-02 LB
ZIRCONIUM NITRATE	3.4E 04 7.5E 04	2.0E 04 4.4E 04	4.2E 04 9.3E 04	1.5E 04 KG 3.2E 04 LB	9.0E 00 2.0E 01	1.2E 01 2.7E 01	8.4E-01 1.9E+01	1.9E-01 8.7E-02	1.0E-02 4.6E-03	5.6E-02 KG 2.5E-02 LB
ZIRCONIUM OXY-CHLORIDE	6.2E 03 1.4E 04	2.0E 04 4.4E 04	7.2E 03 1.6E 04	1.5E 04 KG 3.2E 04 LB	9.0E 00 2.0E 01	1.2E 01 2.7E 01	8.4E-01 1.9E+01	1.9E-01 8.7E-02	5.6E-03 2.5E-03	5.6E-02 KG 2.5E-02 LB
ZIRCONIUM POTASSIUM FLUORIDE	3.2E 03 7.0E 03	4.1E 03 9.0E 03	5.4E 03 1.2E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.9E 01	1.8E 01 4.0E 01	1.4E 00 3.0E+01	1.0E 00 4.7E 00	7.3E-01 3.4E-01	3.1E 00 KG 1.4E 00 LB
ZIRCONIUM SULFATE	2.2E 04 4.8E 04	2.0E 04 4.4E 04	3.3E 04 7.3E 04	1.5E 04 KG 3.2E 04 LB	9.2E 00 2.0E 01	1.2E 01 2.7E 01	8.7E+01 1.9E+01	1.9E-01 8.7E-02	1.2E-02 5.5E-03	5.6E-02 KG 2.5E-02 LB
ZIRCONIUM TETRA-CHLORIDE	6.4E 03 1.4E 04	4.1E 03 9.0E 03	1.1E 04 2.4E 04	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.5E 01	1.6E 01 3.5E 01	1.1E 00 2.5E+01	1.8E 00 4.7E-01	3.7E-02 1.7E-02	3.1E-01 KG 1.4E-01 LB

TABLE N-2

SUMMARY OF HARMFUL QUANTITIES
AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ACETALDEHYDE	2.3E 03 9.1E 03	4.1E 03 9.1E 03	5.9E 03 6.7E 04	2.1E 03 LTK 5.4E 02 GAL	9.6E 00 6.5E 01	1.3E 01 5.9E 02	9.3E-01 6.2E-01	6.1E-01 1.9E-01	7.6E-02 3.5E-02	1.3E+01 LTK 4.4E-01 GAL
ACETIC ACID	5.3E 03 7.4E 03	6.1E 03 9.1E 03	5.6E 03 1.2E 04	2.1E 03 LTK 5.5E 02 GAL	1.2E 01 4.7E 00	1.4E 01 6.3E 02	9.8E-01 6.5E-01	7.1E-01 5.3E-01	5.6E-02 2.4E-02	2.2E+01 LTK 8.2E-01 GAL
ACETIC ANHYDRIDE	4.7E 03 4.3E 03	6.1E 03 6.1E 03	4.9E 03 1.1E 04	2.1E 03 LTK 5.5E 02 GAL	1.0E 01 4.7E 00	1.4E 01 6.2E 02	9.7E-01 6.4E-01	7.5E-01 5.5E-01	5.3E-02 2.4E-02	2.2E+01 LTK 8.2E-01 GAL
ACETONE CYANOHYDRIN	2.2E 03 4.7E 03	6.1E 03 9.1E 03	5.7E 03 8.2E 03	2.1E 03 LTK 5.5E 02 GAL	1.4E 01 6.2E 00	1.8E 01 6.7E 02	1.3E 00 5.9E-01	1.2E 00 5.6E-01	6.9E-02 1.2E-02	3.6E-01 LTK 1.4E 00 GAL
ACETYL BROMIDE	4.3E 03 1.1E 04	7.6E 04 6.9E 04	1.1E 04 2.3E 04	1.3E 04 LTK 4.6E 03 GAL	9.0E 02 6.1E 01	1.2E 01 5.5E 02	8.6E-01 3.9E-01	1.2E-01 9.6E-02	2.4E-02 1.1E-02	9.7E-02 LTK 1.1E-01 GAL
ACETYL CHLORIDE	4.4E 03 9.7E 03	7.6E 04 6.9E 04	7.6E 03 1.6E 04	1.3E 04 LTK 4.8E 03 GAL	9.6E 01 6.5E 00	1.3E 01 5.9E 02	9.3E-01 6.2E-01	1.3E-01 6.1E-02	3.6E-02 1.6E-02	6.7E-02 LTK 1.5E-01 GAL
ACROLEIN	1.9E 01 5.5E 01	3.7E 01 8.2E 01	4.5E 01 1.6E 02	1.9E 01 LTK 5.0E 00 GA	1.3E 01 4.4E 00	1.8E 01 8.8E 00	1.3E 00 9.7E-01	9.7E-01 2.1E 01	3.9E 00 1.8E 00	1.4E 01 L 9.5E 01 GA
ACRYLONITRILE	5.2E 03 1.1E 04	6.1E 03 9.2E 03	6.4E 03 1.9E 04	2.1E 03 LTK 5.5E 02 GAL	1.2E 01 5.5E 00	1.6E 01 7.3E 02	1.2E 00 5.2E-01	7.3E-01 3.3E-01	2.9E-01 1.3E-01	2.2E+01 LTK 8.2E-01 GAL
ADIPONITRILE	3.9E 04 7.9E 04	2.2E 04 6.9E 04	6.1E 04 1.3E 05	1.5E 04 LTK 4.3E 03 GAL	6.4E 00 4.6E 01	1.2E 01 5.3E 02	8.4E-01 3.8E-01	7.8E-02 3.0E-02	3.2E-01 1.9E-01	3.3E+02 LTK 1.2E+02 GAL
ALDRIN (PAP)	5.7E-01 1.3E 00	3.7E 01 8.2E 01	9.7E-01 2.1E 00	2.5E 01 KG 5.6E 01 LB	1.9E 01 8.7E 00	2.8E 01 1.3E 02	1.4E 00 6.3E-01	1.4E 02 6.4E 01	8.4E 02 2.2E 02	8.3E 01 KG 3.7E 01 LB
ALDRIN (TECHNICAL)	9.7E-01 1.7E 00	3.7E 01 8.2E 01	9.7E-01 2.1E 00	2.5E 01 KG 5.6E 01 LB	1.6E 01 7.1E 00	2.4E 01 1.1E 02	1.2E 00 5.4E-01	2.1E 02 9.5E 01	7.2E 02 3.2E 02	9.3E 01 KG 4.2E 01 LB
ALLYL ALCOHOL	5.0E 01 9.9E 01	1.7E 01 8.2E 01	4.5E 01 1.0E 02	1.9E 01 LTK 5.2E 00 GAL	1.0E 01 7.3E 00	2.1E 01 9.7E 01	1.5E 00 6.7E-01	9.7E 01 2.1E 01	3.4E 00 1.4E 00	1.4E 01 LTK 9.5E 01 GAL
ALLYL CHLORIDE	1.0E 03 4.1E 03	6.1E 03 9.1E 03	5.1E 03 6.9E 03	2.1E 03 LTK 5.5E 02 GAL	1.3E 01 5.8E 00	1.7E 01 7.8E 02	1.2E 00 5.5E-01	9.1E-01 2.8E-01	3.7E-02 1.6E-02	1.8E+01 LTK 6.8E-01 GAL
ALUMINUM ALKYLS	2.2E 02 2.4E 02	6.1E 02 8.2E 02	1.3E 02 7.4E 02	2.3E 02 KG 5.2E 02 LB	1.1E 01 5.1E 02	1.5E 01 6.8E 02	1.1E 00 4.8E-01	9.2E-01 4.2E-01	9.6E-01 2.2E-01	2.7E 02 KG 1.2E 02 LB
ALUMINUM SULFATE	1.1E 04 2.4E 04	2.2E 04 6.9E 04	1.9E 04 6.1E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.6E 02	1.0E 00 4.7E-01	1.7E-01 7.0E-02	1.1E-02 5.2E-03	9.2E+02 KG 2.2E+02 LB

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SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOWN (KG-LB)	INCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	INCO $/KG/LB	P.SOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIA	1.5E 02 3.3E 02	4.1E 02 9.2E 02	2.5E 02 5.5E 02	2.5E 02 KG 5.5E 02 LB	1.1E 01 2.4E 01	2.1E 01 4.6E 01	1.5E 00 3.3E-01	4.3E 00 1.0E 01	1.0E 00 2.2E-01	1.5E 00 KG 3.3E-01 LB
AMMONIUM ACETATE	1.0E 04 2.3E 04	2.2E 04 4.9E 04	1.8E 04 3.9E 04	1.1E 04 KG 1.2E 04 LB	1.1E 01 2.4E 01	1.5E 01 3.3E 01	1.1E 00 2.4E-01	1.3E-01 2.8E-02	1.0E-02 2.2E-03	8.7E-02 KG 1.9E-02 LB
AMMONIUM BENZOATE	1.9E 04 4.2E 04	2.2E 04 4.9E 04	3.2E 03 7.0E 03	1.5E 04 KG 3.2E 04 LB	9.6E 00 2.1E 01	1.2E 01 2.7E 01	9.9E-01 2.2E-01	1.2E-01 2.6E-02	9.2E-03 2.0E-03	1.2E-02 KG 2.5E-02 LB
AMMONIUM BICARBONATE	1.1E 03 2.5E 03	6.1E 03 1.3E 04	1.8E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	1.1E 01 2.4E 01	1.9E 01 4.2E 01	1.4E 00 3.2E-01	9.5E-01 2.5E-01	1.0E-01 2.5E-02	1.0E-01 KG 2.3E-02 LB
AMMONIUM BICHROMATE	4.2E 03 9.3E 03	2.2E 04 4.9E 04	1.2E 03 2.7E 03	1.9E 04 KG 4.2E 04 LB	1.2E 01 2.6E 01	1.6E 01 3.4E 01	1.2E 00 2.7E-01	1.2E-01 3.1E-02	2.3E-02 5.1E-03	3.2E-02 KG 7.0E-02 LB
AMMONIUM BIFLUORIDE	4.4E 03 9.7E 03	2.2E 04 4.9E 04	7.4E 03 1.6E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.4E 01	1.7E 01 3.9E 01	1.2E 00 2.6E-01	1.4E-01 3.4E-02	3.0E-02 1.0E-02	4.2E-02 KG 1.3E-02 LB
AMMONIUM BISULFITE	1.0E 04 2.2E 04	2.2E 04 4.9E 04	2.6E 04 5.8E 03	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.4E 01	1.3E 01 2.9E 01	9.5E-01 2.1E-01	1.0E-01 2.6E-02	9.7E-03 2.4E-03	1.3E-02 KG 2.8E-02 LB
AMMONIUM BROMIDE	8.2E 03 1.8E 04	4.1E 03 9.2E 03	8.2E 03 1.8E 03	2.5E 03 KG 5.5E 03 LB	1.1E 01 2.4E 01	2.3E 01 5.0E 01	1.4E 00 3.2E-01	5.5E-01 2.3E-01	1.1E-01 1.4E-01	1.4E-01 KG 3.2E-02 LB
AMMONIUM CARBAMATE	4.2E 02 9.2E 02	4.1E 02 9.2E 02	6.7E 02 1.5E 03	2.1E 02 KG 5.3E 02 LB	1.1E 01 2.4E 01	2.1E 01 4.6E 01	1.5E 00 3.3E-01	5.9E 00 2.5E 01	3.0E-01 1.7E-01	1.0E 00 KG 7.3E-01 LB
AMMONIUM CARBONATE	1.9E 03 4.2E 03	2.2E 04 4.9E 04	2.4E 03 5.3E 03	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.4E 01	1.9E 01 4.2E 01	1.4E 00 3.1E-01	1.0E-01 2.5E-02	9.0E-03 2.0E-03	1.3E-02 KG 2.8E-02 LB
AMMONIUM CHLORIDE	2.4E 02 5.3E 02	4.1E 02 9.2E 02	4.5E 02 9.8E 02	2.3E 02 KG 5.0E 02 LB	1.1E 01 2.4E 01	2.1E 01 4.6E 01	1.5E 00 3.3E-01	5.5E 00 2.5E 01	5.7E-01 2.6E-01	1.0E 00 KG 7.3E-01 LB
AMMONIUM CHROMATE	1.1E 04 2.5E 04	2.2E 04 4.9E 04	1.4E 04 3.1E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.4E 01	1.5E 01 3.3E 01	1.1E 00 2.4E-01	1.0E-01 2.6E-02	1.0E-02 2.3E-03	1.3E-02 KG 2.8E-02 LB
AMMONIUM CITRATE,	1.4E 04 3.1E 04	2.2E 04 4.9E 04	2.7E 04 5.9E 03	1.5E 04 KG 3.2E 04 LB	9.6E 00 2.1E 01	1.2E 01 2.7E 01	9.9E-01 2.2E-01	1.2E-01 2.6E-02	9.2E-03 2.0E-03	1.2E-02 KG 2.5E-02 LB
AMMONIUM FLUOBORATE	5.1E 02 1.2E 03	4.1E 03 9.2E 03	8.9E 02 2.0E 03	2.3E 03 KG 5.0E 03 LB	1.1E 01 2.4E 01	1.9E 01 4.2E 01	1.4E 00 3.2E-01	9.5E-01 2.5E-01	2.9E-01 1.3E-01	1.0E-01 KG 7.3E-02 LB
AMMONIUM FLUORIDE	8.8E 03 1.9E 04	2.2E 04 4.9E 04	1.5E 04 3.3E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.4E 01	1.9E 01 4.2E 01	1.1E 00 2.4E-01	1.0E-01 2.6E-02	1.7E-02 7.6E-03	3.0E-02 KG 1.3E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIUM FLUORATE	8.4E 03 1.8E 04	2.2E 04 4.9E 04	1.0E 00 2.2E 00	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 04	1.6E 01 7.1E 00	1.1E 00 5.0E-01	1.0E-01 4.6E-02	1.7E-02 7.9E-03	3.4E-02 KG 1.5E-02 LB
AMMONIUM HYDROXIDE	4.4E 02 1.5E 03	6.1E 03 9.4E 03	1.1E 03 2.5E 03	2.1E 03 LTR 5.5E 02 GAL	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	5.5E-01 2.5E-01	2.3E-01 1.1E-01	1.0E-01 LTR 4.1E-01 GAL
AMMONIUM HYDROPHOSPHITE	4.1E 02 9.1E 02	6.1E 02 9.0E 02	7.2E 02 1.5E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	5.5E 00 2.5E 00	1.6E-01 1.7E-01	1.0E 01 KG 7.3E-01 LB
AMMONIUM IODIDE	7.0E 02 1.5E 03	6.1E 03 9.4E 03	1.2E 03 2.6E 03	2.3E 03 KG 5.2E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	5.5E-01 2.5E-01	2.0E-01 9.2E-02	1.0E+01 KG 7.3E-02 LB
AMMONIUM MOLYBDATE	6.1E 02 1.1E 03	6.1E 03 9.4E 03	6.2E 02 1.4E 03	2.3E 03 KG 4.8E 03 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	5.5E-01 2.5E-01	2.0E-01 1.3E-01	1.0E+01 KG 7.3E-02 LB
AMMONIUM NITRATE	1.3E 03 8.4E 02	6.1E 02 9.4E 02	6.4E 02 1.5E 03	2.3E 02 KG 5.2E 02 LB	1.5E 01 7.2E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	5.5E 00 2.5E 00	1.9E-01 1.0E-01	1.0E 00 KG 7.3E-01 LB
AMMONIUM OXALATE	8.4E 03 2.1E 04	2.2E 04 4.9E 04	1.0E 00 1.0E 00	1.5E 04 KG 3.2E 04 LB	9.2E 00 4.2E 00	1.2E 01 5.3E 00	8.7E-01 4.0E-01	1.3E-01 4.9E-02	1.0E-02 7.1E-03	5.0E+02 KG 1.3E+02 LB
AMMONIUM PENTABORATE	1.3E 03 2.4E 03	6.1E 03 9.4E 03	2.2E 03 4.9E 03	2.3E 03 KG 5.2E 03 LB	1.1E 01 4.2E 00	1.6F 01 6.7L 00	1.2E 00 5.9E-01	5.5E-01 2.5E-01	1.1E-01 5.2E-02	1.0E-01 KG 7.3E-02 LB
AMMONIUM PERSULFATE	5.7E 02 1.3E 03	6.1E 03 9.4E 03	8.7E 02 2.1E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	5.5E-01 2.5E-01	2.5E-01 1.1E-01	1.0E-01 KG 7.3E-02 LB
AMMONIUM SILICOFLUORIDE	2.2E 03 4.8E 03	6.1E 03 9.4E 03	5.7E 03 8.2E 03	2.3E 03 KG 5.2E 03 LB	1.4E 01 6.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	5.5E-01 2.5E-01	6.9E-02 3.1E-02	1.0E+01 KG 7.3E-02 LB
AMMONIUM SULFAMATE	8.4E 03 2.0E 04	2.2E 04 4.9E 04	1.5E 04 3.5E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 04	1.5E 01 7.2E 00	1.1E 00 5.2E-01	1.0E-01 4.6E-02	1.6E-02 7.2E-03	3.4E-02 KG 1.5E-02 LB
AMMONIUM SULFATE	1.5E 02 1.7E 02	6.1E 02 9.4E 02	5.9E 02 1.3E 03	2.3E 02 KG 5.2E 02 LB	1.5E 01 6.8E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	5.5E 00 2.5E 00	6.3E-01 1.9E-01	1.0E 01 KG 7.3E+01 LB
AMMONIUM SULFIDE	1.1E 04 2.6E 04	2.2E 04 4.9E 04	1.0E 00 2.1E 00	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.2E 00	1.5E 01 6.7E 00	1.1E 00 4.8E-01	1.0E-01 4.6E-02	1.4E-02 6.3E-03	3.0E-02 KG 1.3E-02 LB
AMMONIUM SULFITE	1.1E 04 2.1E 04	2.2E 04 4.9E 04	1.4E 04 3.0E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.2E 00 4.8E-01	1.0E-01 4.6E-02	1.4E-02 6.5E-03	3.0E-02 KG 1.3E-02 LB
AMMONIUM TARTRATE	1.5E 04 2.4E 04	2.2E 04 4.9E 04	2.1E 04 4.7E 04	1.5E 04 KG 3.2E 04 LB	8.8E 03 4.0E 04	1.2E 01 5.3E 00	8.0E-01 3.6E-01	1.0E-01 4.6E-02	1.2E-02 5.5E-03	3.0E-02 KG 1.3E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOMAN (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIUM THIOCYANATE	9.7E 03 1.1E 04	2.2E 04 4.9E 04	8.5E 03 1.9E 04	1.9E 04 KG 3.2E 04 LB	1.3E 01 5.4E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.2E-01 4.6E-02	2.6E-02 1.3E-02	3.2E-02 KG 1.3E-02 LB
AMMONIUM THIOSULFATE	1.4E 04 2.6E 04	3.2E 04 6.9E 04	4.4E 04 9.8E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.8E 00	1.0E 00 4.7E-01	1.2E-01 4.6E-02	1.2E-02 5.5E-03	1.2E-02 KG 1.3E-02 LB
AMYL ACETATE	2.9E 03 6.3E 03	6.1E 03 1.4E 04	6.8E 03 1.5E 04	2.1E 03 LTK 5.0E 02 GAL	1.0E 01 6.7E 00	1.4E 01 9.2E 00	9.7E-01 6.4E-01	2.4E-01 1.1E-01	3.0E-02 1.7E-02	7.2E-02 LTK 2.7E-01 GAL
ANILINE	4.0E 02 1.1E 03	9.1E 03 2.4E 04	8.2E 02 1.8E 03	2.1E 03 LTK 4.1E 02 GAL	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.2E-01	7.3E-01 3.3E-01	3.1E-01 1.4E-01	2.2E-01 LTK 8.2E-01 GAL
ANTIMONY PENTAFLUORIDE	9.7E 02 2.1E 03	2.1E 04 4.7E 04	1.4E 03 3.0E 03	2.1E 03 KG 4.2E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.3E-01	9.2E-01 4.2E-01	1.3E-01 5.9E-02	2.7E-01 KG 1.2E-01 LB
ANTIMONY PENTAFLUORIDE	9.1E 02 2.7E 03	2.1E 04 6.0E 04	1.3E 03 3.9E 03	2.3E 03 KG 6.8E 03 LB	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	9.2E 00 4.2E 00	1.4E-01 1.9E-01	2.7E 00 KG 1.2E 00 LB
ANTIMONY POTASSIUM TARTRATE	1.4E 03 3.1E 03	3.1E 04 6.9E 04	2.0E 03 4.4E 03	2.1E 03 KG 4.6E 03 LB	1.9E 01 8.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	9.2E-01 4.2E-01	9.2E-02 4.1E-02	2.7E-01 KG 1.2E-01 LB
ANTIMONY TRICHLORIDE	1.2E 03 2.6E 03	2.7E 04 6.0E 04	1.7E 03 3.8E 03	2.3E 03 KG 5.1E 03 LB	1.4E 01 6.6E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	9.2E-01 4.2E-01	1.1E-01 4.9E-02	2.7E-01 KG 1.2E-01 LB
ANTIMONY TRICHLORIDE	7.5E 02 1.7E 03	1.7E 04 3.7E 04	1.1E 03 2.4E 03	2.3E 03 KG 5.1E 03 LB	1.5E 01 6.8E 00	2.2E 01 9.7E 00	1.6E 00 6.9E-01	9.2E-01 4.2E-01	1.3E-01 7.7E-02	2.7E-01 KG 1.2E-01 LB
ANTIMONY TRIFLUORIDE	5.7E 02 1.3E 03	1.3E 04 2.8E 04	8.3E 02 1.8E 03	2.3E 03 KG 5.1E 03 LB	1.9E 01 8.9E 00	2.2E 01 9.7E 00	1.6E 00 6.9E-01	9.2E-01 4.2E-01	2.2E-01 1.2E-01	2.7E-01 KG 1.2E-01 LB
ANTIMONY TRIOXIDE	1.4E 03 3.2E 03	3.1E 04 6.9E 04	2.0E 03 4.4E 03	2.3E 03 KG 5.1E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	9.2E-01 4.2E-01	7.7E-02 3.5E-02	2.7E-01 KG 1.2E-01 LB
ARSENIC TRICHLORIDE	4.4E 03 9.7E 03	9.7E 04 2.1E 05	6.4E 03 1.4E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 5.7E 00	1.7E 01 7.8E 00	1.2E 00 5.4E-01	1.7E-01 7.8E-02	2.9E-02 1.3E-02	3.2E-02 KG 2.2E-02 LB
ARSENIC ACID	4.0E 02 1.1E 03	9.1E 03 2.4E 04	8.2E 02 1.8E 03	1.9E 01 LTK 5.0E 02 GAL	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.3E-01	1.1E 02 4.9E 01	2.6E-01 1.2E-01	3.3E 01 LTK 1.2E 02 GAL
ARSENIC DISULFIDE	4.0E 02 1.1E 03	9.1E 03 2.4E 04	8.2E 02 1.8E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	7.4E 01 3.4E 01	2.1E-01 9.7E-02	2.3E 01 KG 1.0E 01 LB
ARSENIC PENTOXIDE	7.0E 02 1.9E 03	1.7E 04 4.2E 04	1.2E 03 2.9E 03	2.3E 03 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.3E-01	1.1E 02 4.9E 01	1.6E-01 8.1E-02	3.3E 01 KG 1.5E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOMAR (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ARSENIC TRIOXIDE	1.0E 03 3.1E 03	3.7E 01 8.2E 01	2.4E 03 5.2E 03	2.3E 01 KG 5.0E 01 LB	1.3E 0. 3.0E 0.	1.7E 01 7.9E 00	1.2E 00 2.6E-01	1.1E 02 4.9E 01	9.0E-02 4.1E-02	3.3E 01 KG 1.5E 01 LB
ARSENIC TRICHLORIDE	8.3E 02 1.8E 03	3.7E 01 8.2E 01	1.4E 03 3.1E 03	2.3E 01 KG 5.0E 01 LB	1.4E 0. 3.3E 01	1.8E 01 8.3E 00	1.3E 00 2.9E-01	1.1E 02 4.9E 01	1.5E-01 6.9E-02	3.3E 01 KG 1.5E 01 LB
ARSENIC TRIOXIDE FLUORIDE	8.1E 02 1.0E 03	3.7E 01 8.2E 01	1.8E 03 2.3E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.2E 01	1.8E 01 8.2E 00	1.3E 00 5.9E-01	1.1E 02 4.9E 01	2.0E-01 9.3E-02	3.3E 01 KG 1.5E 01 LB
ARSENIC TRIOXIDE TRIIODE	2.2E 03 4.5E 03	3.7E 01 8.2E 01	3.4E 03 7.5E 03	2.3E 01 KG 5.0E 01 LB	1.0E 01 2.2E 01	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.1E 02 4.9E 01	6.2E-02 2.8E-02	3.3E 01 KG 1.5E 01 LB
ARSENIC TRISULFIDE	4.4E 02 9.7E 02	3.7E 01 8.2E 01	7.4E 02 1.6E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.2E 01	1.9E 01 8.9E 00	1.4E 00 6.3E-01	1.1E 02 4.9E 01	2.9E-01 1.3E-01	3.3E 01 KG 1.5E 01 LB
ARSENIC TRISULFIDE	5.3E 02 1.2E 03	3.7E 01 8.2E 01	8.4E 02 2.0E 03	2.3E 01 KG 5.0E 01 LB	8.4E 02 1.8E 03	1.2E 01 5.3E 00	8.4E-01 3.8E-01	7.0E 01 3.0E 01	2.0E-01 8.9E-02	2.3E 01 KG 1.0E 01 LB
ARSENIC	1.0E 03 2.2E 03	6.1E 03 1.3E 04	2.3E 03 5.1E 03	2.1E 03 LTN 5.5E 02 GAL	1.3E 01 2.8E 01	1.8E 01 8.0E 00	1.3E 00 5.7E-01	2.0E-01 1.1E-01	6.2E-02 1.8E-02	7.2E-02 LTN 2.7E-01 GAL
ARSENIC ACID	7.3E 02 1.7E 03	4.0E 03 9.0E 03	1.3E 03 2.9E 03	1.3E 03 LTN 8.0E 02 GAL	9.5E 02 2.1E 03	1.3E 01 5.8E 00	9.1E-01 4.1E-01	1.0E-01 4.6E-02	1.0E-02 4.7E-03	3.0E-02 LTN 1.1E-01 GAL
ARSENOUS HALIDE	5.4E 02 1.2E 03	1.1E 03 2.5E 03	5.4E 02 1.2E 03	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.4E 01 6.2E 00	1.0E 00 4.4E-01	7.3E-01 3.3E-01	4.6E-02 2.0E-02	2.2E-01 KG 9.8E-02 LB
ARSINYL CHLORIDE	7.3E 03 1.7E 04	4.0E 03 9.0E 03	1.3E 03 2.9E 03	1.3E 03 LTN 8.0E 02 GAL	9.5E 02 2.1E 03	1.2E 01 5.3E 00	8.9E-01 4.0E-01	1.3E-01 5.7E-02	1.0E-02 4.7E-03	4.2E-02 LTN 1.5E-01 GAL
ARSINYL CHLORIDE	7.2E 03 1.7E 04	2.0E 03 4.5E 03	1.2E 03 2.6E 03	1.3E 03 LTN 8.0E 02 GAL	5.8E 02 1.3E 03	1.2E 01 5.3E 00	9.0E-01 4.0E-01	9.2E-02 4.1E-02	1.5E-02 6.6E-03	2.0E-02 LTN 1.0E-01 GAL
BERYLLIUM CHLORIDE	5.0E 03 1.1E 04	2.0E 03 4.5E 03	9.9E 03 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 2.7E 01	1.9E 01 7.9E 00	1.2E 00 5.3E-01	1.7E-01 7.6E-02	2.2E-02 9.8E-03	5.2E-02 KG 2.2E-02 LB
BERYLLIUM FLUORIDE	1.0E 02 2.2E 02	4.1E 02 9.1E 02	2.0E 02 4.1E 02	2.3E 02 KG 5.1E 02 LB	1.5E 01 3.3E 01	2.0E 01 9.2E 00	1.4E 00 6.1E-01	9.2E 00 4.2E 00	7.7E-01 3.5E-01	2.7E 00 KG 1.2E 00 LB
BERYLLIUM HYDROXIDE	2.5E 03 5.5E 03	6.1E 03 1.3E 04	4.2E 03 9.3E 03	2.3E 03 KG 5.1E 03 LB	8.0E 0. 1.8E 01	1.2E 01 5.3E 00	8.0E-01 3.6E-01	6.1E-01 2.8E-01	6.1E-02 1.4E-02	1.4E-01 KG 6.2E-02 LB
BERYLLIUM NITRATE	1.0E 04 2.2E 04	4.0E 04 9.0E 04	3.1E 04 6.8E 04	1.5E 04 KG 3.2E 04 LB	1.5E 01 3.4E 01	1.9E 01 8.6E 00	1.4E 00 6.3E-01	1.7E-01 7.6E-02	6.9E-03 3.1E-03	5.4E-02 KG 2.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
BERYLLIUM SULFATE	1.0E 00 2.2E 00	2.2E 00 4.9E 00	1.0E 00 1.9E 00	1.5E 00 KG 3.2E 00 LB	1.1E 01 2.5E 00	1.9E 01 4.0E 00	1.1E 00 4.0E-01	1.7E-01 7.6E-02	1.2E-02 5.5E-03	2.5E-02 KG 5.2E-02 LB
BROMINE	1.5E 03 3.3E 03	4.1E 02 9.1E 02	2.1E 03 4.0E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.4E 00	1.7E 01 3.9E 00	1.2E 00 2.9E-01	9.8E 00 4.4E 00	6.0E-02 3.0E-02	2.9E 01 KG 1.3E 00 LB
BUTYL ACETATE	2.5E 03 5.5E 03	6.1E 03 1.3E 01	4.1E 03 9.5E 03	2.1E 03 LTR 5.5E 02 GAL	1.1E 02 2.4E 01	1.5E 01 3.4E 00	1.1E 00 2.7E-01	4.3E-01 1.9E-01	9.0E-02 2.7E-02	1.3E-01 LTR 4.8E-01 GAL
BUTYL AMINE	8.9E 02 1.9E 03	2.1E 03 4.7E 03	1.5E 03 3.3E 03	2.1E 03 LTR 5.5E 02 GAL	4.0E 01 8.1E 00	1.9E 01 4.2E 00	1.3E 00 3.9E-01	1.3E-01 1.9E-01	2.7E-01 9.2E-02	1.3E-01 LTR 4.8E-01 GAL
BUTYRIC ACID	8.9E 03 1.9E 04	2.1E 03 4.8E 03	1.5E 04 3.3E 04	2.1E 02 LTR 5.5E 01 GAL	1.5E 01 3.3E 00	1.9E 01 4.1E 00	1.3E 00 3.9E-01	7.5E 00 3.5E 00	2.7E-02 9.2E-03	2.2E 00 LTR 8.1E 00 GAL
CADMIUM ACETATE	2.2E 02 4.8E 02	5.1E 01 1.1E 02	3.7E 02 1.7E 03	2.3E 01 KG 5.0E 01 LB	3.7E 00 8.1E-01	4.8E 01 1.0E 01	3.3E-01 9.5E-02	1.9E 00 9.5E-01	1.1E 00 4.9E-01	2.5E 01 KG 1.0E 01 LB
CADMIUM BROMIDE	3.3E 02 7.3E 02	7.7E 01 1.7E 02	5.0E 02 1.2E 03	2.3E 01 KG 5.0E 01 LB	5.0E 00 1.1E 00	6.4E 01 1.4E 01	4.4E 00 1.3E-01	2.5E 00 1.2E-01	1.5E-01 6.5E-02	2.5E 01 KG 1.0E 01 LB
CADMIUM CHLORIDE	2.2E 02 4.9E 02	5.1E 01 1.1E 02	3.7E 02 8.2E 02	2.3E 01 KG 5.0E 01 LB	3.7E 00 8.1E-01	4.8E 01 1.0E 01	3.3E-01 9.5E-02	1.9E 00 9.5E-01	1.1E 00 4.8E-01	2.5E 01 KG 1.0E 01 LB
CADMIUM NITRATE	3.1E 02 6.9E 02	7.2E 01 1.6E 02	5.1E 02 1.1E 03	2.3E 01 KG 5.0E 01 LB	5.1E 00 1.1E 00	6.7E 01 1.4E 01	4.6E 00 1.3E-01	2.6E 00 1.2E-01	1.5E-01 6.7E-02	2.5E 01 KG 1.0E 01 LB
CADMIUM SULFATE	2.5E 02 5.5E 02	5.7E 01 1.3E 02	4.2E 02 9.2E 02	2.3E 01 KG 5.0E 01 LB	4.2E 00 9.2E-01	5.4E 01 1.2E 01	3.7E 00 1.1E-01	2.2E 00 1.1E-01	1.3E-01 5.5E-02	2.5E 01 KG 1.0E 01 LB
CALCIUM ARSENATE	7.7E 02 1.7E 03	1.8E 02 3.9E 02	1.2E 03 2.9E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.8E 00	1.7E 01 3.7E 00	1.2E 00 3.4E-01	6.7E 00 3.4E 00	3.9E-01 1.7E-01	2.5E 01 KG 1.0E 01 LB
CALCIUM ARSENITE	1.5E 03 3.3E 03	3.7E 02 7.9E 02	2.5E 03 5.6E 03	2.3E 01 KG 5.0E 01 LB	2.5E 01 5.5E 00	3.2E 01 7.0E 00	2.2E 00 6.4E-01	1.3E 01 6.4E 00	7.5E-01 3.2E-01	2.5E 01 KG 1.0E 01 LB
CALCIUM CARBIDE	4.7E 03 1.0E 04	1.1E 03 2.4E 03	7.4E 03 1.6E 04	1.5E 02 KG 3.2E 02 LB	7.4E 01 1.6E 01	9.5E 01 2.1E 01	6.5E 00 1.9E 00	3.8E 01 1.9E 01	2.2E 00 9.5E-01	1.5E 02 KG 3.2E 02 LB
CALCIUM CARBONATE	1.0E 04 2.2E 04	2.5E 03 5.4E 03	1.7E 04 3.6E 04	1.5E 02 KG 3.2E 02 LB	1.7E 02 3.6E 01	2.1E 02 4.6E 01	1.4E 01 4.3E 00	8.5E 01 4.3E 01	5.0E 00 2.1E 00	1.5E 02 KG 3.2E 02 LB
CALCIUM CYANIDE	9.7E 03 2.1E 04	2.3E 03 5.0E 03	1.6E 04 3.5E 04	2.3E 01 KG 5.0E 01 LB	1.6E 02 3.5E 01	2.0E 02 4.4E 01	1.4E 01 4.1E 00	8.2E 01 4.1E 01	4.8E 00 2.0E 00	2.3E 02 KG 5.0E 02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CALCIUM HYPOCHLORITE	1.1E 01 2.4E 01	5.7E 01 1.2E 02	1.9E 01 4.1E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.0E 01 2.2E 01	1.3E 00 2.7E 00	6.1E 01 1.3E 02	1.3E 01 2.9E 01	1.8E 01 KG 4.0E 01 LB
CALCIUM OXIDE	5.5E 03 1.2E 04	2.6E 04 5.8E 04	9.7E 03 2.1E 04	1.5E 04 KG 3.2E 04 LB	9.5E 00 2.1E 01	1.5E 01 3.3E 01	9.5E-01 2.0E+00	1.5E+01 3.2E+01	2.7E-02 1.2E-02	3.8E-02 KG 1.3E-02 LB
CAPTAN (SOLID)	1.0E 01 2.1E 01	5.1E 01 1.1E 02	2.0E 01 4.3E 01	8.5E 01 KG 1.9E 02 LB	1.0E 01 2.2E 01	1.5E 01 3.3E 01	1.1E 00 2.4E-01	6.2E 01 1.3E 02	1.3E 01 2.9E 01	1.7E 01 KG 3.9E 01 LB
CAPTAN (SOLUTION)	1.0E 01 2.1E 01	5.1E 01 1.1E 02	2.0E 01 4.3E 01	8.5E 01 KG 1.9E 02 LB	1.0E 01 2.2E 01	2.2E 01 4.8E 01	1.0E 00 2.2E-01	6.1E 01 1.3E 02	1.3E 01 2.9E 01	1.8E 01 KG 4.0E 01 LB
CARBON DISULFIDE	4.9E 01 1.1E 02	2.4E 02 5.3E 02	1.0E 02 2.2E 02	2.1E 02 LTR 5.0E 02 GAL	1.0E 01 2.2E 01	1.5E 01 3.3E 01	1.1E 00 2.4E-01	6.0E-01 1.3E-01	2.5E-02 1.1E-02	1.4E-01 LTR 3.0E-01 GAL
CARBOFUR	8.1E 00 1.8E 01	4.0E 01 8.8E 01	1.7E 01 3.7E 01	2.1E 01 LTR 5.0E 02 GAL	1.5E 01 3.3E 01	1.7E 01 3.7E 01	1.2E 00 2.7E-01	5.4E-01 1.2E-01	2.5E-01 1.1E-01	1.4E-01 LTR 3.1E-01 GAL
CHLORINE	8.0E 00 1.7E 01	3.9E 01 8.6E 01	1.6E 01 3.6E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.4E 01 3.0E 01	1.0E 00 2.2E-01	6.1E 01 1.3E 02	1.3E 01 2.9E 01	1.8E 01 KG 4.0E 01 LB
CHLORINATED PHENOL	9.7E-01 2.1E 00	4.7E 00 1.0E 01	2.0E 00 4.4E 00	2.8E 01 LTR 6.2E 02 GAL	1.0E 01 2.2E 01	1.3E 01 2.8E 01	9.0E-01 2.0E-01	1.4E 02 3.0E 02	2.4E 02 5.3E 02	8.3E 01 LTR 1.8E 02 GAL
CHLORINE DIOXIDE	9.7E-01 2.1E 00	4.7E 00 1.0E 01	1.9E 00 4.2E 00	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.5E 01 3.3E 01	1.1E 00 2.4E-01	2.1E 02 4.5E 02	4.2E 02 9.2E 02	5.0E 01 KG 2.0E 01 LB
CHLORINATED BENZENE	4.8E 02 1.0E 03	2.3E 03 5.1E 03	9.5E 02 2.1E 03	2.1E 02 LTR 5.0E 02 GAL	1.5E 01 3.3E 01	1.7E 01 3.7E 01	1.2E 00 2.6E-01	6.7E 00 1.5E 01	1.2E-01 5.5E-02	2.9E 00 LTR 7.5E 00 GAL
CHLOROFORM	5.5E 03 1.2E 04	2.6E 04 5.8E 04	1.1E 04 2.4E 04	2.1E 02 LTR 5.0E 02 GAL	1.4E 01 3.1E 01	1.7E 01 3.7E 01	1.2E 00 2.6E-01	6.7E 00 1.5E 01	1.9E-02 8.5E-03	2.0E 00 LTR 7.5E 00 GAL
CHLOROSULFONIC ACID	5.0E 03 1.1E 04	2.4E 04 5.3E 04	5.5E 03 1.2E 04	2.1E 03 LTR 5.0E 03 GAL	1.0E 01 2.2E 01	1.3E 01 2.9E 01	9.5E-01 2.1E-01	5.5E-01 1.2E+00	6.6E-02 2.1E-02	1.4E-01 LTR 4.1E-01 GAL
CHROMIC ACETATE	2.7E 02 6.0E 02	1.3E 03 2.8E 03	6.0E 02 1.3E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.3E 01	2.1E 01 4.6E 01	1.5E 00 3.3E-01	9.2E 00 2.0E 01	5.6E-01 2.5E-01	2.7E 00 KG 1.2E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CHROMIC ACID	1.0E 03 3.2E 03	4.1E 03 9.0E 03	2.5E 03 5.0E 03	2.1E 03 LTN 5.5E 02 GAL	1.4E 01 4.5E 02	1.9E 01 4.7E 00	1.4E 00 6.2E-01	9.2E-01 4.2E-01	9.8E-02 6.4E-02	2.7E-01 LTN 1.8E 00 GAL
CHROMIC SULFATE	4.7E 02 4.7E 02	4.1E 02 4.0E 02	4.7E 02 1.5E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 4.9E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	9.2E 00 4.2E 00	3.8E-01 1.7E-01	2.7E 00 KG 1.2E 00 LB
CHROMOUS CARBONATE	1.2E 02 2.7E 02	4.1E 02 9.0E 02	2.1E 02 4.6E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 4.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	9.2E 00 4.2E 00	8.4E-01 3.8E-01	2.7E 00 KG 1.2E 00 LB
CHROMOUS CHLORIDE	1.3E 02 2.9E 02	4.1E 02 9.0E 02	2.2E 02 4.9E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.2E 00	2.1E 01 9.6E 00	1.5E 00 6.9E-01	9.2E 00 4.2E 00	1.1E 00 5.2E-01	2.7E 00 KG 1.2E 00 LB
CHROMOUS OXALATE	1.8E 02 3.9E 02	4.1E 02 9.0E 02	3.0E 02 6.5E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	9.2E 00 4.2E 00	8.6E-01 3.9E-01	2.7E 00 KG 1.2E 00 LB
CHROMYL CHLORIDE	2.2E 03 4.9E 03	4.1E 03 9.0E 03	3.8E 03 8.3E 03	2.3E 03 KG 5.0E 03 LB	1.7E 01 7.9E 00	2.3E 01 1.1E 01	1.7E 00 7.5E-01	9.2E-01 4.2E-01	6.7E-02 3.1E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS ACETATE	1.8E 03 4.1E 03	4.1E 03 9.0E 03	3.1E 03 6.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.9E 01 8.2E 00	1.3E 00 5.9E-01	9.2E-01 4.2E-01	6.8E-02 3.1E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS BROMIDE	1.0E 03 3.0E 03	4.1E 03 9.0E 03	2.0E 03 4.1E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	9.2E-01 4.2E-01	7.7E-02 3.5E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS CHLORIDE	1.0E 03 3.9E 03	4.1E 03 9.0E 03	3.0E 03 6.5E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 6.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	9.2E-01 4.2E-01	7.2E-02 3.3E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS CITRATE	1.4E 03 3.2E 03	4.1E 03 9.0E 03	2.5E 03 5.4E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.9E 01 8.4E 00	1.3E 00 6.0E-01	9.2E-01 4.2E-01	8.7E-02 3.9E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS FLUORIDE	4.6E 02 1.1E 03	4.1E 03 9.2E 03	8.2E 02 1.8E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	9.2E-01 4.2E-01	2.0E-01 1.2E-01	2.7E-01 KG 1.2E-01 LB
COBALTOUS FORMATE	1.4E 03 3.0E 03	4.1E 03 9.2E 03	2.3E 03 5.1E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.4E 01 6.3E 00	1.3E 00 5.9E-01	9.2E-01 4.2E-01	9.2E-02 4.2E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS IODIDE	2.3E 03 5.1E 03	4.1E 03 9.0E 03	3.9E 03 8.7E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.8E 01 8.4E 00	1.3E 00 6.0E-01	9.2E-01 4.2E-01	5.4E-02 2.5E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS NITRATE	2.2E 03 4.7E 03	4.1E 03 9.0E 03	3.6E 03 8.0E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 6.3E 00	1.9E 01 8.4E 00	1.3E 00 6.0E-01	9.2E-01 4.2E-01	5.8E-02 2.7E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS PERCHLORATE	2.7E 03 6.0E 03	4.1E 03 9.0E 03	4.6E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	9.2E-01 4.2E-01	4.6E-02 2.1E-02	2.7E-01 KG 1.2E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
COBALTOUS SUCCINATE	4.4E 02 1.0E 03	4.1E 03 9.0E 03	1.5E 03 3.3E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	9.2E-01 4.2E-01	1.2E-01 5.3E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS SULFAMATE	1.0E 03 2.2E 03	4.1E 03 9.0E 03	3.0E 03 6.5E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.0E 00	1.8E 01 8.2E 00	1.3E 00 5.7E-01	9.2E-01 4.2E-01	7.2E-02 3.3E-02	2.7E-01 KG 1.2E-01 LB
COBALTOUS SULFATE	2.1E 03 4.6E 03	4.1E 03 9.0E 03	3.6E 03 7.9E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 6.3E 00	1.4E 01 8.3E 00	1.3E 00 6.2E-01	9.2E-01 4.2E-01	6.4E-02 2.7E-02	2.7E-01 KG 1.2E-01 LB
COUMAPHOS (PURE)	7.4E 02 1.7E 03	3.7E 01 8.2E 01	1.3E 01 2.9E 01	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.4E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	8.7E 01 3.1E 01	1.3E 01 5.4E 00	2.1E 01 KG 9.3E 00 LB
COUMAPHOS (WETTABLE)	7.9E 02 1.7E 03	3.7E 01 8.2E 01	1.3E 01 2.9E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 6.0E 00	2.2E 01 9.1E 00	1.4E 00 6.5E-01	1.0E 02 4.6E 01	1.9E 01 8.7E 00	3.1E 01 KG 1.4E 01 LB
CRESOL	4.6E 02 9.7E 02	4.1E 02 9.0E 02	7.4E 02 1.6E 03	2.1E 02 LTR 5.5E 01 GAL	1.1E 01 5.3E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	7.3E 00 3.3E 00	3.4E-01 1.6E-01	2.2E 00 LTR 8.2E 00 GAL
CUPRIC ACETATE	1.1E 03 2.4E 03	4.1E 03 9.0E 03	1.9E 03 4.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.4E 00	1.4E 00 6.1E-01	9.2E-01 4.2E-01	1.1E-01 5.2E-02	2.7E-01 KG 1.2E-01 LB
CUPRIC ACETOARSENITE	7.5E 01 1.6E 02	3.7E 01 8.2E 01	1.3E 02 2.8E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 6.1E 02	2.0E 01 9.2E 00	1.5E 00 6.6E-01	7.4E 01 3.4E 01	1.4E 00 6.3E-01	2.3E 01 KG 1.0E 01 LB
CUPRIC ACETYL-ACETONATE	7.9E 01 1.7E 02	4.1E 02 9.0E 02	1.3E 02 2.9E 02	2.3E 02 KG 5.0E 02 LB	1.4E 01 7.1E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	9.2E 00 4.2E 00	1.3E 00 5.9E-01	2.7E 00 KG 1.2E 00 LB
CUPRIC BROMIDE	6.6E 01 1.5E 02	4.1E 02 9.0E 02	1.1E 02 2.5E 02	2.3E 02 KG 5.0E 02 LB	1.0E 01 4.6E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	9.2E 00 4.2E 00	1.9E 00 8.7E-01	2.7E 00 KG 1.2E 00 LB
CUPRIC CHLORIDE	4.4E 01 1.0E 02	4.1E 02 9.0E 02	8.2E 01 1.8E 02	2.3E 02 KG 5.0E 02 LB	1.0E 01 4.6E 00	2.2E 01 1.0E 01	1.6E 00 7.1E-01	9.2E 00 4.2E 00	2.6E 00 1.2E 00	2.7E 00 KG 1.2E 00 LB
CUPRIC FORMATE	4.4E 01 9.7E 01	4.1E 02 9.0E 02	7.4E 01 1.6E 02	2.3E 02 KG 5.0E 02 LB	1.1E 01 5.0E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	9.2E 00 4.2E 00	2.9E 00 1.3E 00	2.7E 00 KG 1.2E 00 LB
COPPER GLUCONATE	1.3E 02 2.9E 02	4.1E 02 9.0E 02	2.2E 02 4.9E 02	2.3E 02 KG 5.0E 02 LB	1.0E 01 7.0E 00	2.1E 01 9.7E 00	1.5E 00 6.9E-01	9.2E 00 4.2E 00	9.6E-01 4.3E-01	2.7E 00 KG 1.2E 00 LB
CUPRIC GLYCINATE	8.8E 01 1.9E 02	4.1E 02 9.0E 02	1.5E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.0E 01 7.0E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	9.2E 00 4.2E 00	1.4E 00 6.5E-01	2.7E 00 KG 1.2E 00 LB
CUPRIC LACTATE	8.8E 01 1.9E 02	4.1E 02 9.0E 02	1.5E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.0E 01 7.0E 00	2.2E 01 9.8E 00	1.5E 00 7.0E-01	9.2E 00 4.2E 00	1.4E 00 6.5E-01	2.7E 00 KG 1.2E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CUPRIC NITRATE	4.8E 01 1.9E 02	4.1E 02 9.0E 02	1.5E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.6 01 7.0 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	9.2E 00 4.2E 00	1.4E 00 6.5E-01	2.7E 00 KG 1.2E 00 LB
CUPRIC OXALATE	4.8E 01 1.1E 02	4.1E 02 9.0E 02	8.2E 01 1.9E 02	2.3E 02 KG 5.0E 02 LB	1.4 01 6.4 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	6.1E 00 2.8E 00	2.1E 00 9.7E-01	1.0E 00 KG 4.5E-01 LB
CUPRIC SUBACETATE	5.4E 01 1.2E 02	4.1E 02 9.0E 02	9.2E 01 2.0E 02	2.3E 02 KG 5.2E 02 LB	1.6 01 7.2 00	2.1E 01 9.4E 00	1.5E 00 6.8E-01	9.2E 00 4.2E 00	2.3E 00 1.1E 00	2.7E 00 KG 1.2E 00 LB
CUPRIC SULFATE	3.5E 02 7.7E 02	4.1E 02 9.0E 02	5.9E 02 1.3E 03	2.3E 02 KG 5.0E 02 LB	1.5 01 6.9 00	2.0E 01 9.2E 00	1.3E 00 6.0E-01	9.2E 00 4.2E 00	5.0E-01 1.0E-01	2.7E 00 KG 1.2E 00 LB
CUPRIC SULFATE AMMONIATED	7.5E 01 1.0E 02	4.1E 02 9.0E 02	1.3E 02 2.8E 02	2.3E 02 KG 5.0E 02 LB	1.0E 01 7.0E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	9.2E 00 4.2E 00	1.7E 00 7.7E-01	2.7E 00 KG 1.2E 00 LB
CUPRIC TARTRATE	7.9E 01 1.7E 02	4.1E 02 9.0E 02	1.3E 02 2.9E 02	2.3E 02 KG 5.0E 02 LB	1.5 01 6.7 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	6.1E 00 2.8E 00	1.3E 00 5.9E-01	1.0E 00 KG 4.5E-01 LB
CUPROUS BROMIDE	4.5E 01 9.9E 01	4.1E 02 9.0E 02	7.3E 01 1.6E 02	2.3E 02 KG 5.0E 02 LB	1.5 01 7.0 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	6.1E 00 2.8E 00	2.4E 00 1.1E 00	1.0E 00 KG 4.5E-01 LB
CUPROUS IODIDE	5.4E 01 1.2E 02	4.1E 02 9.0E 02	9.4E 01 2.1E 02	2.3E 02 KG 5.0E 02 LB	1.3 01 5.8 00	1.7E 01 7.8E 00	1.2E 00 5.5E-01	6.1E 00 2.8E 00	1.0E 00 4.4E-01	1.0E 00 KG 4.5E-01 LB
CYANOGEN CHLORIDE	3.5E 04 7.7E 00	3.7E 01 8.2E 01	5.9E 00 1.3E 01	2.3E 01 KG 5.0E 01 LB	1.3 01 5.9 00	1.7E 01 7.4E 00	1.2E 00 5.0E-01	1.1E 02 4.9E 01	5.0E 01 2.3E 01	5.3E 01 KG 1.5E 01 LB
CYCLOHEXANE	1.0E 03 3.7E 03	4.1E 03 9.0E 03	2.3E 03 5.1E 03	2.1E 03 LTR 5.5E 02 GAL	9.1 00 4.1 00	1.2E 01 5.5E 00	8.7E-01 3.9E-01	2.4E-01 1.1E-01	8.0E-02 1.8E-02	7.2E-02 LTR 2.7E-01 GAL
2,4-D ACID (PURE)	1.5E 04 3.4E 04	2.2E 04 4.9E 04	2.6E 04 5.7E 04	1.5E 04 KG 3.2E 04 LB	1.0 01 4.7 00	1.4E 01 6.2E 00	9.7E-01 4.4E-01	6.7E-02 3.1E-02	6.7E-03 3.0E-03	2.2E-02 KG 9.8E-03 LB
2,4-D ACID (+ETTABLE)	3.5E 02 7.7E 02	4.1E 02 9.0E 02	5.9E 02 1.3E 03	2.3E 02 KG 5.0E 02 LB	1.1 01 4.9 00	1.4E 01 6.6E 00	1.0E 00 4.7E-01	5.5E 00 2.5E 00	6.3E-01 1.9E-01	1.0E 00 KG 7.3E-01 LB
2,4-D ESTERS (PURE)	4.8E 01 1.9E 02	4.1E 02 9.0E 02	1.5E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.2 01 5.4 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	3.7E 00 1.7E 00	1.2E 00 5.3E-01	1.1E 00 KG 4.9E-01 LB
2,4-D ESTERS (+ETTABLE)	4.8E 01 1.9E 02	4.1E 02 9.0E 02	1.3E 02 3.3E 02	2.3E 02 KG 5.0E 02 LB	1.3 01 5.7 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	5.5E 00 2.5E 00	1.7E 00 7.8E-01	1.0E 00 KG 7.3E-01 LB
DALAPON	4.8E 03 1.0E 04	2.2E 04 4.9E 04	7.4E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	1.2 01 5.0 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	1.7E-01 7.6E-02	3.3E-02 1.5E-02	5.0E-02 KG 2.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY						
					COST OF PREVENTION						
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/L'VIT
DDT (PURE)	4.2E-01 9.2E-01	3.7E 01 8.2E 01	7.1E-01 1.6E 00	2.3E 01 KG 5.0E 01 LB	9.7E 00 4.4E 00	1.3E 01 5.9E 00	9.2E-01 4.2E-01	1.4E 02 6.4E 01	7.0E 02 3.2E 02	4.3E 01 KG 2.0E 01 LB	
DDT (+ETTABLE)	4.2E-01 9.2E-01	3.7E 01 8.2E 01	7.1E-01 1.6E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	2.1E 02 9.5E 01	9.7E 02 4.4E 02	6.4E 01 KG 2.9E 01 LB	
DIAZINON (PURE)	9.7E-01 2.1E 00	3.7E 01 8.2E 01	1.6E 00 3.6E 00	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.8E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	4.0E 01 1.8E 01	1.1E 02 4.8E 01	1.2E 01 KG 5.4E 00 LB	
DIAZINON (+ETTABLE)	9.7E-01 2.1E 00	3.7E 01 8.2E 01	1.6E 00 3.6E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	6.1E 01 2.8E 01	1.6E 02 7.1E 01	1.8E 01 KG 8.0E 00 LB	
DICAMBA	1.9E 03 4.1E 03	4.1E 03 9.0E 03	5.8E 03 6.5E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.0E 00	1.8E 01 8.0E 00	1.3E 00 5.7E-01	9.2E+01 4.2E+01	8.6E+02 3.9E+02	2.7E+01 KG 1.2E+01 LB	
DICHLONIL (PURE)	6.5E 00 1.4E 01	4.1E 03 9.0E 03	1.1E 03 2.4E 03	2.3E 03 KG 5.0E 03 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	6.1E+01 2.8E+01	1.6E+01 7.2E+02	1.8E+01 KG 8.2E+02 LB	
DICHLONIL (+ETTABLE)	6.5E 02 1.4E 03	4.1E 03 9.0E 03	1.1E 03 2.4E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 9.2E 00	1.4E 00 6.4E-01	9.2E-01 4.2E-01	2.3E+01 1.1E+01	2.7E+01 KG 1.2E+01 LB	
DICHLONE (PURE)	1.4E 02 3.0E 00	3.7E 01 8.2E 01	3.8E 00 8.5E 00	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	6.7E 01 3.1E 01	5.9E 01 2.7E 01	2.1E 01 KG 9.3E 00 LB	
DICHLONE (+ETTABLE)	1.4E 02 3.0E 00	3.7E 01 8.2E 01	3.8E 00 8.5E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.8E 02 8.0E 01	8.6E 01 3.9E 01	3.1E 01 KG 1.4E 01 LB	
DICHLORVOS	3.1E 01 6.8E 01	3.7E 01 8.2E 01	5.2E 01 1.1E 02	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.0E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.8E 02 8.0E 01	4.9E 00 2.2E 00	3.1E 01 KG 1.4E 01 LB	
DIELDRIN (PURE)	3.5E-01 7.6E-01	3.7E 01 8.2E 01	5.9E-01 1.3E 00	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.4E 02 6.4E 01	7.9E 02 3.6E 02	4.3E 01 KG 2.0E 01 LB	
DIELDRIN (+ETTABLE)	3.5E-01 7.6E-01	3.7E 01 8.2E 01	5.9E-01 1.3E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	2.1E 02 9.5E 01	1.2E 03 5.3E 02	6.4E 01 KG 2.9E 01 LB	
DIETHYLAMINE	3.7E 03 8.2E 03	4.1E 03 9.0E 03	4.3E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	4.3E+01 1.9E+01	4.1E+02 1.9E+02	1.3E+01 KG 5.7E+02 LB	
DIMETHYLAMINE	3.7E 03 8.2E 03	4.1E 03 9.0E 03	4.3E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	4.3E+01 1.9E+01	4.1E+02 1.9E+02	1.3E+01 KG 5.7E+02 LB	
DINITROPHENOL	1.5E 03 3.4E 03	4.1E 02 9.0E 02	6.6E 03 5.7E 03	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	5.5E 00 2.5E 00	9.8E-02 4.5E-02	1.6E 00 KG 7.3E-01 LB	

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY						
					COST OF PREVENTION						
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
NITRAT	1.9E 03 3.4E 03	4.1E 03 9.1E 03	2.4E 03 5.7E 03	2.3E 03 KG 5.0E 03 LB	1.3E +1 6.1E 00	1.9E 01 4.1E 00	1.3E 00 5.9E-01	9.2E-01 4.2E-01	9.0E-02 4.5E-02	2.7E-01 KG 1.2E-01 LB	
DISULFOTON (PURE)	2.4E 00 4.7E 00	5.7E 01 1.2E 02	4.8E 00 1.0E 01	2.3E 01 KG 5.2E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	6.7E 01 3.1E 01	5.7E 01 1.7E 01	2.1E 01 KG 9.3E 00 LB	
DISULFOTON (WETTABLE)	2.4E 00 8.2E 00	5.7E 01 1.9E 02	4.8E 00 1.7E 01	2.3E 01 KG 5.2E 01 LB	1.4E 01 7.4E 00	2.2E 0 9.9E 00	1.6E 00 7.1E-01	1.0E 02 4.6E 01	5.4E 01 2.4E 01	5.1E 01 KG 1.4E 01 LB	
DILRIN (PURE)	1.0E 02 3.9E 02	2.1E 02 8.4E 02	3.2E 02 8.5E 02	2.3E 02 KG 5.2E 02 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	6.1E 00 2.8E 00	5.9E-01 2.7E-01	1.8E 00 KG 8.1E-01 LB	
DILRON (WETTABLE)	1.9E 02 3.9E 02	4.1E 02 8.2E 02	3.0E 02 8.5E 02	2.3E 02 KG 5.0E 02 LB	1.0E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	9.2E 00 4.2E 00	8.6E-01 1.9E-01	2.7E 00 KG 1.2E 00 LB	
DINITROBENZENE SULFONIC ACID	7.9E 02 1.7E 03	4.1E 03 9.1E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.4E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	5.5E-01 2.5E-01	1.9E-01 9.7E-02	1.6E-01 KG 7.3E-02 LB	
DURSBAN (PURE)	1.4E 00 3.0E 00	3.7E 01 8.2E 01	2.0E 00 6.1E 00	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	6.7E 01 3.1E 01	6.2E 01 2.8E 01	2.1E 01 KG 9.3E 00 LB	
DURSBAN (WETTABLE)	1.4E 00 3.4E 00	3.7E 01 8.2E 01	2.9E 00 6.1E 00	2.3E 01 KG 5.0E 01 LB	1.4E 01 7.4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.0E 02 4.6E 01	9.1E 01 4.2E 01	3.1E 01 KG 1.4E 01 LB	
ENDOSULFAN (PURE)	1.4E-01 3.2E-01	3.7E 01 8.2E 01	2.5E-01 5.4E-01	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.4E-01	6.7E 01 3.1E 01	7.1E 02 3.2E 02	2.1E 01 KG 9.3E 00 LB	
ENDOSULFAN (WETTABLE)	1.4E-01 3.2E-01	3.7E 01 8.2E 01	2.5E-01 5.4E-01	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.3E-01	1.0E 02 4.6E 01	1.0E 03 4.7E 02	3.1E 01 KG 1.4E 01 LB	
ENDRIN (PURE)	2.4E-02 5.2E-02	3.7E 01 8.2E 01	4.5E-02 9.8E-02	2.3E 01 KG 5.2E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.4E 02 6.4E 01	1.0E 04 4.7E 03	4.3E 01 KG 2.7E 01 LB	
ENDRIN (WETTABLE)	2.4E-02 5.2E-02	3.7E 01 8.2E 01	4.5E-02 9.8E-02	2.3E 01 KG 5.2E 01 LB	1.4E 01 6.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	2.1E 02 9.5E 01	1.5E 04 6.9E 03	4.7E 01 KG 2.9E 01 LB	
ETHION (PURE)	9.7E 00 1.9E 01	3.7E 01 8.2E 01	9.7E 00 2.1E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	6.7E 01 3.1E 01	1.8E 01 8.2E 00	2.1E 01 KG 9.3E 00 LB	
ETHION (WETTABLE)	9.7E 00 1.9E 01	3.7E 01 8.2E 01	9.7E 00 2.1E 01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.3E 00	2.1E 01 9.7E 00	1.5E 00 6.9E-01	1.2E 02 6.0E 01	2.4E 01 1.2E 01	3.1E 01 KG 1.4E 01 LB	
ETHYLBENZENE	1.3E 03 2.4E 03	4.1E 03 9.0E 03	2.2E 03 6.7E 03	2.1E 03 LTR 5.5E 02 GAL	0.0E 10 0.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	4.3E-01 1.9E-01	8.6E-02 3.9E-02	1.3E-01 LTR 4.8E-01 GAL	

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ETHYLENEDIAMINE	1,3E 03 2,9E 03	4,1E 03 9,2E 03	2,2E 03 4,9E 03	2,1E 03 LTR 5,5E 02 GAL	1,3E 01 2,1E 00	1,8E 01 2,1E 00	1,3E 00 5,8E-01	7,3E-01 3,3E-01	1,3E-01 6,1E-02	2,2E-01 LTR 8,2E-01 GAL
EDTA	2,2E 04 4,9E 04	6,2E 04 1,3E 04	9,7E 04 2,2E 04	1,5E 04 LTR 4,0E 03 GAL	4,2E 00 9,2E 00	1,2E 01 2,7E 00	9,4E-01 2,1E-01	1,1E-01 5,1E-02	4,7E-03 2,1E-03	5,3E-02 LTR 1,2E-01 GAL
FERRIC AMMONIUM CITRATE	1,1E 03 2,3E 03	4,1E 03 9,2E 03	1,0E 03 3,9E 03	2,3E 03 KG 5,0E 03 LB	1,3E 01 6,2E 00	1,9E 01 8,8E 00	1,4E 00 6,3E-01	9,2E-01 4,2E-01	1,2E-01 5,4E-02	2,7E-01 KG 1,2E-01 LB
FERRIC CHLORIDE	9,4E 02 1,9E 03	4,1E 03 9,2E 03	1,5E 03 3,3E 03	2,3E 03 KG 5,0E 03 LB	1,4E 01 6,2E 00	1,9E 01 8,7E 00	1,4E 00 6,2E-01	9,2E-01 4,2E-01	1,4E-01 6,5E-02	2,7E-01 KG 1,2E-01 LB
FERRIC FLUORIDE	8,8E 02 1,1E 03	4,1E 03 9,2E 03	8,2E 02 1,8E 03	2,3E 03 KG 5,0E 03 LB	1,4E 01 6,5E 00	1,9E 01 8,7E 00	1,4E 00 6,2E-01	9,2E-01 4,2E-01	2,6E-01 1,2E-01	2,7E-01 KG 1,2E-01 LB
FERRIC NITRATE	1,3E 03 2,9E 03	4,1E 03 9,2E 03	2,2E 03 4,9E 03	2,3E 03 KG 5,0E 03 LB	1,4E 01 6,4E 00	1,9E 01 8,5E 00	1,3E 00 6,1E-01	9,2E-01 4,2E-01	9,4E-02 4,3E-02	2,7E-01 KG 1,2E-01 LB
FERRIC PHOSPHATE	6,1E 02 1,4E 03	4,1E 03 9,2E 03	1,0E 03 2,3E 03	2,3E 03 KG 5,0E 03 LB	1,3E 01 6,1E 00	1,9E 01 8,1E 00	1,3E 00 5,8E-01	8,1E-01 2,8E-01	1,7E-01 7,8E-02	1,8E-01 KG 8,2E-02 LB
FERRIC SULFATE	8,8E 02 1,9E 03	4,1E 03 9,2E 03	1,5E 03 3,3E 03	2,3E 03 KG 5,0E 03 LB	1,3E 01 6,1E 00	2,0E 01 9,0E 00	1,4E 00 6,5E-01	9,2E-01 4,2E-01	1,4E-01 6,5E-02	2,7E-01 KG 1,2E-01 LB
FERROUS AMMONIUM SULFATE	8,8E 02 1,9E 03	4,1E 03 9,2E 03	1,5E 03 3,3E 03	2,3E 03 KG 5,0E 03 LB	1,3E 01 6,1E 00	1,9E 01 8,8E 00	1,4E 00 6,3E-01	9,2E-01 4,2E-01	1,4E-01 6,5E-02	2,7E-01 KG 1,2E-01 LB
FERROUS CHLORIDE	4,1E 02 1,4E 03	4,1E 03 9,2E 03	1,0E 03 2,3E 03	2,3E 03 KG 5,0E 03 LB	1,3E 01 6,0E 00	2,0E 01 9,0E 00	1,4E 00 6,4E-01	9,2E-01 4,2E-01	2,0E-01 9,3E-02	2,7E-01 KG 1,2E-01 LB
FERROUS OXALATE	5,7E 02 1,3E 03	4,1E 03 9,2E 03	9,7E 02 2,1E 03	2,3E 03 KG 5,0E 03 LB	1,3E 01 5,9E 00	1,7E 01 7,9E 00	1,2E 00 5,7E-01	8,1E-01 2,8E-01	1,8E-01 8,2E-02	1,8E-01 KG 8,2E-02 LB
FERROUS SULFATE	8,8E 02 1,9E 03	4,1E 03 9,2E 03	1,5E 03 3,3E 03	2,3E 03 KG 5,0E 03 LB	1,3E 01 6,0E 00	2,0E 01 8,9E 00	1,4E 00 6,3E-01	9,2E-01 4,2E-01	1,4E-01 6,5E-02	2,7E-01 KG 1,2E-01 LB
FORMALDEHYDE	1,1E 03 2,4E 03	4,1E 03 9,2E 03	1,9E 03 4,1E 03	2,1E 03 LTR 5,5E 02 GAL	9,2E 04 4,1E 00	1,3E 01 5,9E 00	9,1E-01 4,1E-01	6,1E-01 2,8E-01	1,3E-01 7,3E-02	1,8E-01 LTR 6,8E-01 GAL
FORMIC ACID	7,7E 03 1,7E 04	2,2E 04 4,9E 04	1,3E 04 2,9E 04	1,5E 04 LTR 4,0E 03 GAL	1,3E 01 6,1E 00	1,4E 01 6,4E 00	1,0E 00 4,6E-01	1,3E-01 6,1E-02	2,3E-02 1,0E-02	4,7E-02 LTR 1,5E-01 GAL
FUMARIC ACID	6,1E 03 1,3E 04	2,2E 04 4,9E 04	1,2E 04 2,3E 04	1,5E 04 LTR 4,0E 03 GAL	9,1E 00 4,1E 00	1,3E 01 5,9E 00	9,2E-01 6,2E-01	1,4E-01 6,8E-02	2,5E-02 1,1E-02	3,7E-02 LTR 1,1E-01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
FURFURAL	1.1E 03 2.5E 03	4.1E 03 9.0E 03	1.0E 03 3.9E 03	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 5.9E 00	1.7E 01 7.8E 00	1.2E 00 5.5E-01	7.5E-01 3.3E-01	1.4E-01 6.5E-02	2.2E-01 LTR 8.2E-01 GAL
GUTHION (PURE)	1.3E 00 2.9E 00	3.7E 01 8.2E 01	2.2E 00 4.9E 00	2.3E 01 KG 5.0E 01 LB	1.3E 01 6.5E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	6.7E 01 1.1E 01	7.8E 01 3.5E 01	2.1E 01 KG 9.3E 00 LB
GUTHION (WETTABLE)	1.3E 00 2.9E 00	3.7E 01 8.2E 01	2.2E 00 4.9E 00	2.3E 01 KG 5.0E 01 LB	1.3E 01 7.2E 00	2.1E 01 9.4E 00	1.5E 00 6.9E-01	1.0E 02 4.4E 01	1.1E 02 5.2E 01	3.1E 01 KG 1.4E 01 LB
HEPTACHLOR (PURE)	8.3E-01 1.8E 00	3.7E 01 8.2E 01	1.4E 00 3.1E 00	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.5E 00	1.6E 01 7.3E 00	1.2E 00 5.2E-01	1.4E 02 6.4E 01	5.3E 02 1.5E 02	4.3E 01 KG 2.0E 01 LB
HEPTACHLOR (WETTABLE)	8.3E-01 1.8E 00	3.7E 01 8.2E 01	1.4E 00 3.1E 00	2.3E 01 KG 5.0E 01 LB	1.9E 01 8.8E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	2.1E 02 9.5E 01	4.8E 02 2.2E 02	4.4E 01 KG 2.0E 01 LB
HYDROCHLORIC ACID	2.0E 03 4.5E 03	8.1E 03 1.8E 04	3.4E 03 7.5E 03	2.1E 03 LTR 5.5E 02 GAL	1.0E 01 4.5E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	5.5E-01 2.5E-01	7.5E-02 3.4E-02	1.6E-01 LTR 6.1E-01 GAL
HYDROFLUORIC ACID	1.4E 02 3.1E 02	5.1E 02 1.1E 03	2.3E 02 5.1E 02	2.1E 02 LTR 5.5E 01 GAL	1.3E 01 6.7E 00	1.4E 01 6.3E 00	9.4E-01 4.3E-01	7.3E 00 3.3E 00	1.3E 02 5.4E-01	2.2E 00 LTR 8.2E 00 GAL
HYDROGEN CYANIDE	7.9E 00 1.7E 01	5.1E 01 1.1E 02	1.3E 01 2.9E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.8E 00	1.7E 01 7.8E 00	1.2E 00 5.6E-01	8.1E 01 3.7E 01	1.9E 01 8.5E 00	2.5E 01 KG 1.1E 01 LB
HYDRAZINE	2.2E 02 4.8E 02	9.1E 02 2.0E 03	5.7E 02 8.2E 02	2.3E 02 KG 5.2E 02 LB	1.2E 01 5.4E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	5.5E 00 2.5E 00	6.9E-01 3.1E-01	1.4E 00 KG 7.3E-01 LB
HYDROXYLAMINE	6.4E 03 1.5E 04	2.2E 04 4.9E 04	1.1E 04 2.5E 04	1.5E 04 LTR 4.2E 03 GAL	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	1.3E-01 6.1E-02	2.3E-02 1.0E-02	4.1E-02 LTR 1.5E-01 GAL
ISOPRENE	3.3E 03 7.3E 03	9.1E 03 2.0E 04	5.6E 03 1.2E 04	2.1E 03 [illegible] 5.5E 02 [illegible]	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.2E-01	2.4E-01 1.1E-01	1.7E-02 7.6E-03	7.2E-02 LTR 2.7E-01 GAL
ISOPROPANOLAMINE DODECYLBENZENE SULFONATE	9.2E 02 2.0E 03	4.1E 03 9.0E 03	1.6E 03 3.4E 03	2.3E 03 [illegible] 5.0E 03 LB	2.1E-01 2.1E-01	2.8E-01 2.8E-01	2.0E-01 2.7E-01	5.5E-01 2.5E-01	1.0E-01 7.4E-02	1.0E-01 KG 7.3E-02 LB
KELTHANE (PURE)	4.4E 03 9.7E 03	4.1E 03 9.0E 03	7.4E 03 1.6E 04	2.3E 03 KG 5.0E 03 LB	1.1E 01 5.1E 00	1.5E 01 6.6E 00	1.0E 00 4.7E-01	1.0E-01 8.3E-02	2.3E-02 1.1E-02	5.4E-02 KG 2.4E-02 LB
KELTHANE (WETTABLE)	4.4E 03 9.7E 03	4.1E 03 9.0E 03	7.4E 03 1.6E 04	2.3E 03 KG 5.0E 03 LB	1.1E 01 5.1E 00	1.7E 01 7.8E 00	1.2E 00 5.0E-01	8.9E-01 2.2E-01	3.4E-02 1.6E-02	1.4E-01 KG 6.5E-02 LB
LEAD ACETATE	5.0E 03 1.2E 04	5.7E 01 8.2E 01	9.4E 03 2.1E 04	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.0E-01	7.4E 01 3.4E 01	4.1E-02 1.9E-02	2.3E 01 KG 1.0E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
LEAD BROMIDE	5.4E 03 1.2E 04	3.7E 01 8.2E 01	9.4E 03 2.1E 04	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.9E 01 4.2E 01	1.4E 00 3.2E-01	7.4E 01 1.6E 02	4.1E-02 1.9E-02	2.3E 01 KG 1.0E 01 LB
LEAD CHLORIDE	1.7E 04 4.3E 04	7.7E 01 1.9E 02	3.3E 04 7.2E 04	2.3E 01 KG 5.0E 01 LB	9.1E 04 2.0E 05	1.2E 01 2.6E 01	8.7E-01 1.9E-01	7.4E 01 1.6E 02	1.2E-02 5.4E-03	2.3E 01 KG 1.0E 01 LB
LEAD FLUOBORATE	5.4E 03 1.2E 04	3.7E 01 8.2E 01	9.4E 03 2.1E 04	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	2.0E 01 4.3E 01	1.4E 00 3.2E-01	7.4E 01 1.6E 02	4.1E-02 1.9E-02	2.3E 01 KG 1.0E 01 LB
LEAD FLUORIDE	8.3E 02 1.8E 03	5.7E 01 1.2E 02	1.4E 03 3.1E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.8E 01	1.8E 01 3.9E 01	1.3E 00 2.9E-01	7.4E 01 1.6E 02	2.5E-01 1.1E-01	2.3E 01 KG 1.0E 01 LB
LEAD IODIDE	6.9E 03 1.5E 04	3.7E 01 8.2E 01	1.1E 04 2.5E 04	2.3E 01 KG 5.0E 01 LB	1.0E 01 2.2E 01	1.6E 01 3.5E 01	1.1E 00 2.4E-01	7.4E 01 1.6E 02	2.4E-02 1.0E-02	2.3E 01 KG 1.0E 01 LB
LEAD NITRATE	5.4E 03 1.1E 04	3.7E 01 8.2E 01	8.5E 03 1.9E 04	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.7E 01 3.8E 01	1.2E 00 2.6E-01	7.4E 01 1.6E 02	4.6E-02 2.1E-02	2.3E 01 KG 1.0E 01 LB
LEAD STEARATE	1.1E 04 2.4E 04	3.7E 01 8.2E 01	1.9E 04 4.1E 04	2.3E 01 KG 5.0E 01 LB	2.1E 00 4.6E 00	1.7E 01 3.7E 01	1.2E-01 2.6E-02	7.4E 01 1.6E 02	2.1E-02 9.4E-03	2.3E 01 KG 1.0E 01 LB
LEAD SULFATE	4.4E 03 9.8E 03	3.7E 01 8.2E 01	7.5E 03 1.7E 04	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.4E 01 3.1E 01	9.8E-01 2.1E-01	7.4E 01 1.6E 02	8.2E-02 3.7E-02	2.3E 01 KG 1.0E 01 LB
LEAD SULFIDE	3.6E 03 7.9E 03	3.7E 01 8.2E 01	6.2E 03 1.3E 04	2.3E 01 KG 5.0E 01 LB	1.2E 01 2.6E 01	1.8E 01 3.9E 01	1.3E 00 2.8E-01	7.4E 01 1.6E 02	5.3E-02 2.4E-02	2.3E 01 KG 1.0E 01 LB
LEAD TETRAACETATE	4.5E 03 1.0E 04	3.7E 01 8.2E 01	1.1E 04 2.4E 04	2.3E 01 KG 5.0E 01 LB	1.2E 01 2.6E 01	1.8E 01 3.9E 01	1.3E 00 2.8E-01	7.4E 01 1.6E 02	5.4E-02 2.4E-02	2.3E 01 KG 1.0E 01 LB
LEAD THIOCYANATE	4.7E 03 1.0E 04	3.7E 01 8.2E 01	8.0E 03 1.8E 04	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.6E 01 3.6E 01	1.2E 00 2.7E-01	7.4E 01 1.6E 02	4.9E-02 2.2E-02	2.3E 01 KG 1.0E 01 LB
LEAD THIOSULFATE	4.7E 03 1.0E 04	3.7E 01 8.2E 01	8.8E 03 1.7E 04	2.3E 01 KG 5.0E 01 LB	1.1E 01 2.4E 01	1.6E 01 3.5E 01	1.2E 00 2.6E-01	7.4E 01 1.6E 02	4.8E-02 2.1E-02	2.3E 01 KG 1.0E 01 LB
LEAD TUNGSTATE	6.4E 03 1.5E 04	3.7E 01 8.2E 01	1.1E 04 2.5E 04	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.9E 01	1.9E 01 4.1E 01	1.4E 00 3.1E-01	7.4E 01 1.6E 02	2.9E-02 1.3E-02	2.3E 01 KG 1.0E 01 LB
LINDANE (PURE)	1.4E 00 3.1E 00	3.7E 01 8.2E 01	1.7E 00 3.8E 01	2.3E 01 KG 5.0E 01 LB	2.1E 01 4.6E 01	1.4E 01 3.1E 01	1.0E 00 2.3E-01	7.4E 01 1.6E 02	3.2E 01 1.4E 01	4.3E 01 KG 2.0E 01 LB
LINDANE (WETTABLE)	3.4E 00 7.5E 00	3.7E 01 8.2E 01	5.7E 00 1.3E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.8E 01	1.8E 01 3.9E 01	1.3E 00 2.8E-01	2.1E 02 9.5E 01	6.5E 01 2.9E 01	6.4E 01 KG 2.9E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
LITHIUM BICHROMATE	8.3E 03 1.9E 04	2.2E 04 4.9E 04	1.0E 04 3.1E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	1.7E-01 7.6E-02	1.7E-02 7.7E-03	5.4E-02 KG 2.2E-02 LB
LITHIUM CHROMATE	6.0E 03 1.0E 04	2.2E 04 4.9E 04	1.1E 04 2.4E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.6E 00	1.4E 01 7.4E 00	1.2E 00 5.3E-01	1.7E-01 7.6E-02	2.2E-02 1.0E-02	5.0E-02 KG 2.2E-02 LB
LITHIUM FLUORIDE	1.4E 02 3.0E 02	4.1E 02 9.0E 02	3.0E 02 6.5E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.7E 00	2.3E 01 9.2E 00	1.4E 00 6.4E-01	9.2E 00 4.2E 00	6.6E-01 3.0E-01	2.7E 00 KG 1.2E 00 LB
MALATHION (PURE)	5.0E 00 1.1E 01	3.7E 01 8.2E 01	8.5E 00 1.9E 01	1.9E 01 LTR 5.0E 00 GAL	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	6.7E 01 3.1E 01	2.0E 01 9.3E 00	2.1E 01 LTR 7.8E 01 GAL
MALATHION (EMULSIFIABLE)	5.7E 00 1.1E 01	3.7E 01 8.2E 01	8.5E 00 1.9E 01	1.9E 01 LTR 5.0E 00 GAL	1.6E 01 7.5E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.8E 02 8.0E 01	3.6E 01 1.6E 01	3.1E 01 LTR 1.2E 02 GAL
MALEIC ACID	8.1E 03 1.3E 04	2.2E 04 4.9E 04	1.0E 04 2.3E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 6.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	1.0E-01 4.6E-02	2.5E-02 1.1E-02	3.0E-02 KG 1.3E-02 LB
MALEIC ANHYDRIDE	5.1E 03 1.1E 04	2.2E 04 4.9E 04	8.7E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.6E 01 6.6E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	7.8E-02 3.6E-02	3.0E-02 1.3E-02	2.3E-02 KG 1.0E-02 LB
MERCURIC ACETATE	2.1E 01 4.6E 01	3.7E 01 8.2E 01	3.6E 01 7.9E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.6E 00	2.2E 01 1.0E 01	1.6E 00 7.3E-01	1.4E 02 6.4E 01	1.1E 01 5.0E 00	4.3E 01 KG 2.0E 01 LB
MERCURIC CHLORIDE	1.4E 01 4.2E 01	3.7E 01 8.2E 01	3.0E 01 6.7E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.6E 00	2.2E 01 1.0E 01	1.6E 00 7.2E-01	1.4E 02 6.4E 01	1.1E 01 5.0E 00	4.3E 01 KG 2.0E 01 LB
MERCURIC NITRATE	2.2E 01 4.9E 01	3.7E 01 8.2E 01	3.0E 01 6.5E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.6E 00	2.2E 01 1.0E 01	1.6E 00 7.2E-01	1.4E 02 6.4E 01	1.2E 01 4.7E 00	4.3E 01 KG 2.0E 01 LB
MERCURIC OXIDE	1.4E 01 3.1E 01	3.7E 01 8.2E 01	2.4E 01 5.2E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.5E 00 6.6E-01	1.4E 02 6.4E 01	1.3E 01 6.1E 00	4.3E 01 KG 2.0E 01 LB
MERCURIC SULFATE	1.9E 01 4.3E 01	3.7E 01 8.2E 01	3.3E 01 7.2E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	1.4E 02 6.4E 01	1.2E 01 5.4E 00	4.3E 01 KG 2.0E 01 LB
MERCURIC THIOCYANATE	2.1E 01 4.5E 01	3.7E 01 8.2E 01	3.5E 01 7.7E 01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.2E 00	2.1E 01 9.6E 00	1.5E 00 6.9E-01	1.4E 02 6.4E 01	9.1E 00 4.1E 00	4.3E 01 KG 2.0E 01 LB
MERCUROUS NITRATE	1.4E 01 4.1E 01	3.7E 01 8.2E 01	3.1E 01 6.9E 01	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.4E 02 6.4E 01	1.3E 01 5.7E 00	4.3E 01 KG 2.0E 01 LB
METHOXYCHLOR (PURE)	2.7E 00 6.0E 00	3.7E 01 8.2E 01	4.6E 00 1.0E 01	1.9E 01 LTR 5.2E 00 GAL	1.1E 01 4.8E 00	1.4E 01 6.4E 00	1.0E 00 4.6E-01	6.7E 01 3.1E 01	3.8E 01 1.7E 01	2.1E 01 LTR 7.8E 01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
METHOXYCHLOR (+ETTABLE)	2.7E 00 6.2E 00	3.7E 01 8.2E 01	4.6E 00 1.0E 01	1.9E 01 LTR 5.0E 00 GAL	1.0E 01 6.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.0E 02 4.6E 01	5.5E 01 2.5E 01	5.1E 01 LTR 1.2E 02 GAL
METHYL MERCAPTAN	6.6E 01 9.7E 01	4.1E 02 9.0E 02	7.4E 01 1.6E 02	2.5E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.5E 00 6.6E-01	6.1E 00 2.8E 00	1.3E 00 5.7E-01	1.0E 00 KG 4.1E-01 LB
METHYL METHACRYLATE	1.1E 04 2.4E 04	2.2E 04 4.9E 04	1.9E 04 4.1E 04	1.5E 04 LTR 4.0E 03 GAL	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.8E-01 4.1E-01	4.3E-02 2.0E-02	5.3E-03 2.5E-03	1.3E-02 LTR 5.0E-02 GAL
METHYL PARATHION (PURE)	5.5E 02 7.5E 02	4.1E 02 9.0E 02	5.0E 02 1.2E 03	2.1E 02 LTR 5.5E 01 GAL	1.1E 01 4.9E 00	1.4E 01 6.5E 00	1.0E 00 4.4E-01	3.7E 00 1.7E 00	3.1E-01 1.4E-01	1.1E 00 LTR 4.1E 00 GAL
METHYL PARATHION (+ETTABLE)	3.3E 02 7.5E 02	4.1E 02 9.0E 02	5.0E 02 1.2E 03	2.1E 02 LTR 5.5E 01 GAL	1.2E 01 5.0E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	5.5E 00 2.5E 00	4.6E-01 2.1E-01	1.6E 00 LTR 6.1E 00 GAL
MEVINPHOS	1.0E 00 2.2E 00	5.7E 01 4.2E 01	1.7E 00 3.8E 00	1.0E 01 LTR 5.0E 00 GAL	1.0E 01 4.0E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	6.1E 01 2.8E 01	1.0E 02 4.0E 01	1.0E 01 LTR 7.0E 01 GAL
MOLYBDIC TRIOXIDE	1.0E 04 3.0E 04	2.2E 04 4.9E 04	2.0E 04 4.1E 04	1.5E 04 KG 3.2E 04 LB	9.5E 00 4.3E 00	1.3E 01 5.8E 00	9.1E-01 4.1E-01	1.7E-01 7.6E-02	9.3E-03 4.2E-03	5.2E-02 KG 2.2E-02 LB
MONOETHYLAMINE	1.0E 03 3.9E 03	4.1E 02 9.0E 02	3.0E 03 6.5E 03	2.1E 02 LTR 5.5E 01 GAL	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	4.3E 00 1.9E 00	1.0E-01 4.6E-02	1.3E 00 LTR 4.0E 00 GAL
MONOMETHYLAMINE	1.3E 03 2.9E 03	4.1E 02 9.0E 02	2.2E 03 4.9E 03	2.1E 02 LTR 5.5E 01 GAL	1.3E 01 6.0E 00	1.8E 01 8.0E 00	1.3E 00 5.7E-01	4.3E 00 1.9E 00	1.2E-01 5.3E-02	1.3E 00 LTR 4.0E 00 GAL
NALED	7.9E 00 1.7E 01	5.7E 01 4.2E 01	1.3E 01 2.9E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.3E-01	4.0E 01 1.8E 01	1.3E 01 5.9E 00	1.2E 01 KG 5.0E 00 LB
NAPHTHALENE	1.0E 02 4.4E 02	5.7E 01 4.2E 01	5.0E 02 6.5E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.8E 00	1.7E 01 7.4E 00	1.2E 00 5.5E-01	7.0E 01 3.2E 01	3.9E-01 2.1E-01	2.1E 01 KG 9.7E 00 LB
NAPHTHENIC ACID	3.1E 02 6.9E 02	5.7E 01 4.2E 01	5.3E 02 1.2E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.6E 00	1.9E 01 8.4E 00	1.4E 00 6.3E-01	1.1E 02 5.0E 01	4.0E-01 2.2E-01	3.0E 01 KG 1.5E 01 LB
NICKEL ACETATE	9.2E 03 1.1E 04	2.2E 04 4.9E 04	6.5E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	1.7E-01 7.6E-02	2.5E-02 1.1E-02	5.2E-02 KG 2.2E-02 LB
NICKEL AMMONIUM SULFATE	7.9E 03 1.8E 04	2.2E 04 4.9E 04	1.3E 04 3.0E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.6E 01 7.3E 00	1.2E 00 5.2E-01	1.7E-01 7.6E-02	1.0E-02 7.2E-03	5.2E-02 KG 2.2E-02 LB
NICKEL BROMIDE	5.9E 03 1.2E 04	2.2E 04 4.9E 04	9.3E 03 2.0E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	1.7E-01 7.6E-02	2.3E-02 1.0E-02	5.2E-02 KG 2.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
NICKEL CHLORIDE	4.4E 01 1.1E 02	2.2E 04 4.4E 04	8.1E 03 1.6E 04	1.5E 04 KG 3.2E 04 LB	3.3E 01 7.0E 01	1.7E 01 7.0E 00	1.2E 00 5.5E-01	1.7E-01 7.0E-02	2.0E-02 1.2E-02	4.4E-02 KG 9.7E-02 LB
NICKEL FORMATE	3.7E 03 8.2E 03	6.1E 03 9.0E 03	4.3E 03 1.4E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.8E 01	1.7E 01 7.0E 00	1.2E 00 5.5E-01	8.2E-01 4.2E-01	3.4E-02 1.5E-02	7.7E-01 KG 1.7E-01 LB
NICKEL HYDROXIDE	1.9E 03 4.2E 03	6.1E 03 9.3E 03	3.2E 03 7.0E 03	2.3E 03 KG 5.2E 03 LB	4.8E 00 1.0E 01	1.2E 01 5.5E 00	6.4E-01 3.0E-01	6.1E-01 2.8E-01	2.0E-02 2.5E-02	1.4E-01 KG 3.2E-02 LB
NICKEL NITRATE	5.9E 03 1.3E 04	3.4E-24 7.5E-01	1.0E 04 2.2E 04	1.5E 12 2KG 1.5E-39 LB	1.6E 01 7.5E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.1E 23 5.0E 22	2.1E-02 9.6E-03	7.2E-34 2KG 1.1E-33 LB
NICKEL SULFATE	5.5E 03 1.2E 04	2.2E 04 6.9E 04	8.9E 03 2.0E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 5.7E 00	1.7E 01 7.4E 00	1.2E 00 5.4E-01	1.7E-01 7.6E-02	2.4E-02 1.1E-02	5.0E-02 KG 2.2E-02 LB
NITRIC ACID	3.5E 03 7.7E 03	4.1E 03 9.2E 03	5.3E 03 1.3E 04	2.1E 03 LTR 5.5E 02 GAL	9.9E 00 4.5E 00	1.3E 01 6.0E 00	9.0E-01 4.3E-01	9.5E-01 2.5E-01	3.0E-02 2.3E-02	1.4E-01 LTR 6.1E-01 GAL
NITROBENZENE	4.0E 03 1.5E 04	2.0E 04 6.9E 04	1.1E 04 2.5E 04	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	1.7E-01 7.4E-02	2.3E-02 1.0E-02	5.7E-02 LTR 1.9E-01 GAL
NITROGEN DIOXIDE	2.5E 03 5.6E 03	4.1E 03 9.2E 03	4.3E 03 9.5E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	5.5E-01 2.5E-01	7.0E-02 3.2E-02	1.4E-01 KG 7.3E-02 LB
NITROPHENOL	2.2E 03 4.9E 03	6.1E 02 9.2E 02	3.4E 03 7.4E 03	2.3E 02 KG 5.0E 02 LB	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	9.4E 00 4.4E 00	7.4E-02 3.4E-02	2.9E 00 KG 1.3E 00 LB
PARAFORMALDEHYDE	1.1E 03 2.4E 03	4.1E 03 9.2E 03	1.9E 03 4.1E 03	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	5.5L-01 2.5E-01	1.4E-01 6.2E-02	1.4E-01 LTR 6.1E-01 GAL
PARATHION (PURE)	3.1E 01 6.9E 01	3.7E 01 9.2E 01	5.3E 01 1.2E 02	1.4E 01 LTR 5.0E 00 GAL	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	6.7E 01 3.1E 01	3.3E 00 1.5E 00	2.1E 01 LTR 7.8E 01 GAL
PARATHION (WETTABLE)	3.1E 01 6.9E 01	3.7E 01 8.2E 01	5.3E 01 1.2E 02	1.9E 01 LTR 5.0E 00 GAL	1.7E 01 7.8E 00	2.3E 01 1.0E 01	1.6E 00 7.4E-01	1.0E 02 4.6E 01	4.4E 00 2.2E 00	3.1E 01 LTR 1.2E 02 GAL
PENTACHLOROPHENOL	2.2E 02 4.9E 02	3.7E 01 8.2E 01	5.7E 02 8.2E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	7.9E 01 3.2E 01	4.7E-01 2.1E-01	2.1E 01 KG 9.7E 00 LB
PHENOL	5.3E 02 1.2E 03	6.1E 02 9.0E 02	6.9E 02 2.0E 03	2.3E 02 KG 5.0E 02 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	7.3E 00 3.3E 00	2.9E-01 1.3E-01	2.2E 01 KG 9.8E-01 LB
PHOSGENE	2.7E 03 6.0E 03	6.1E 03 9.0E 03	6.0E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.0E-01 4.0E-01	9.5E-01 2.5E-01	5.5E-02 2.5E-02	1.0E-01 KG 7.3E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PHOSPHORIC ACID	8.8E 03 1.9E 04	2.2E 04 4.9E 04	1.5E 04 3.3E 04	1.5E 04 KG 3.2E 04 LB	9.5E 00 4.3E 00	1.3E 01 5.8E 00	9.1E-01 4.1E-01	1.8E-01 4.0E-02	2.8E-02 9.2E-03	3.8E-02 KG 1.9E-02 LB
PHOSPHORUS	2.3E 02 5.1E 02	5.7E 01 1.2E 02	3.9E 00 8.7E 00	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	8.8E 01 1.9E 01	4.4E 01 2.7E 01	1.2E 01 KG 5.4E 02 LB
PHOSPHORUS OXYCHLORIDE	2.8E 03 6.1E 03	6.1E 03 1.3E 03	4.7E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.5E 00	1.5E 01 6.8E 00	9.5E-01 4.3E-01	5.5E-01 2.5E-01	5.4E-02 2.5E-02	1.8E-01 KG 7.3E-02 LB
PHOSPHORUS PENTABROMIDE	1.8E 02 3.9E 02	4.1E 02 9.0E 02	3.0E 02 6.5E 02	2.3E 02 KG 5.0E 02 LB	1.2E 01 4.7E 00	1.4E 01 6.2E 00	9.7E-01 4.0E-01	5.5E 00 2.5E 00	8.7E-01 3.9E-01	1.4E 00 KG 7.3E-01 LB
PHOSPHORUS PENTASULFIDE	2.4E 03 5.3E 03	5.1E 03 9.2E 03	4.1E 03 9.0E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.0E-01 4.0E-01	5.5E-01 2.5E-01	6.2E-02 2.8E-02	1.8E-01 KG 7.3E-02 LB
PHOSPHORUS TRICHLORIDE	2.5E 03 5.6E 03	5.1E 03 9.2E 03	4.1E 03 9.0E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.0E-01 4.0E-01	5.5E-01 2.5E-01	5.9E-02 2.7E-02	1.8E-01 KG 7.3E-02 LB
POLYCHLORINATED BIPHENYLS	1.2E 01 2.7E 01	3.7E 01 8.2E 01	2.1E 01 4.5E 01	1.9E 01 LTR 5.0E 00 GAL	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	1.4E 02 6.4E 01	2.2E 01 1.0E 01	4.3E 01 LTR 1.6E 02 GAL
POTASSIUM ARSENATE	5.7E 02 1.3E 03	1.7E 01 6.4E 01	9.7E 02 2.1E 03	2.5E 01 KG 5.0E 01 LB	1.5E 01 6.6E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	1.1E 02 4.9E 01	2.2E-01 1.0E-01	3.3E 01 KG 1.5E 01 LB
POTASSIUM ARSENITE	1.5E 03 3.3E 03	3.7E 01 8.2E 01	2.5E 03 5.6E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.1E 02 4.9E 01	8.6E-02 3.8E-02	3.3E 01 KG 1.5E 01 LB
POTASSIUM BICHROMATE	5.8E 03 1.3E 04	2.2E 04 4.9E 04	9.9E 03 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.7E-01 7.6E-02	2.6E-02 1.2E-02	5.0E-02 KG 2.2E-02 LB
POTASSIUM CHROMATE	7.4E 03 1.6E 04	2.2E 04 4.9E 04	1.3E 04 2.8E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	1.7E-01 7.6E-02	2.4E-02 9.2E-03	5.3E-02 KG 2.2E-02 LB
POTASSIUM CYANIDE	1.9E 01 4.2E 01	3.7E 01 8.2E 01	3.2E 01 7.1E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	8.1E 01 2.8E 01	8.4E 00 3.6E 00	1.4E 01 KG 4.4E 00 LB
POTASSIUM HYDROXIDE	3.5E 03 7.7E 03	4.1E 03 9.2E 03	9.9E 03 1.3E 04	2.3E 03 KG 5.0E 03 LB	9.9E 00 4.5E 00	1.3E 01 6.2E 00	9.4E-01 4.3E-01	5.5E-01 2.5E-01	4.3E-02 1.9E-02	1.6E-01 KG 7.3E-02 LB
POTASSIUM PERMANGANATE	1.4E 02 3.1E 02	4.1E 02 9.0E 02	3.1E 02 6.9E 02	2.3E 02 KG 5.0E 02 LB	1.4E 01 6.3E 00	1.9E 01 8.4E 00	1.3E 00 6.0E-01	9.2E 00 4.2E 00	8.2E-01 3.7E-01	2.7E 00 KG 1.2E 00 LB
PROPIONIC ACID	8.3E 03 1.8E 04	2.2E 04 4.9E 04	1.4E 04 3.1E 04	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 4.9E 00	1.4E 01 6.2E 00	1.0E 00 4.7E-01	1.3E-01 6.1E-02	2.1E-02 9.8E-03	4.0E-02 LTR 1.5E-01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PROPIONIC ANHYDRIDE	7.2E 03 1.6E 04	2.2E 04 4.9E 04	1.2E 04 2.7E 04	1.5E 04 KG 3.2E 04 LB	1.1 01 5.0 00	1.5E 01 6.6E 00	1.0E 00 4.7E-01	1.3E-01 6.1E-02	2.4E-02 1.1E-02	4.9E-02 KG 1.0E-02 LB
PROPYL ALCOHOL	1.5E 04 3.4E 04	2.2E 04 4.9E 04	2.5E 04 5.7E 04	1.5E 04 LTR 4.0E 03 GAL	9.3 00 4.2 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	7.8E-02 3.6E-02	1.2E-02 5.2E-03	2.3E-02 LTR 9.7E-02 GAL
PYRETHRINS (PURE)	3.2E 03 7.2E 03	4.1E 03 9.0E 03	5.5E 03 1.2E 04	2.1E 03 LTR 5.5E 02 GAL	9.8 00 4.7 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	6.1E-01 2.8E-01	3.2E-02 1.4E-02	1.2E-01 LTR 4.8E-01 GAL
PYRETHRINS (ACETONE)	3.2E 03 7.2E 03	4.1E 03 9.0E 03	5.5E 03 1.2E 04	2.1E 03 LTR 5.5E 02 GAL	1.3 01 6.0 00	1.6E 01 8.0E 00	1.3E 00 5.7E-01	9.2E-01 4.2E-01	4.6E-02 2.1E-02	2.7E-01 LTR 1.0E 00 GAL
PYROGALLIC ACID	7.9E 02 1.7E 03	9.1E 02 9.0E 02	1.3E 03 2.9E 03	2.3E 02 KG 5.0E 02 LB	1.5 01 6.7 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	9.8E 00 4.4E 00	1.9E-01 8.7E-02	2.9E 00 KG 1.3E 00 LB
QUINOLINE	2.2E 02 4.8E 02	2.7E 01 6.2E 01	3.7E 02 8.2E 02	1.9E 01 LTR 5.0E 00 GAL	1.3 01 5.7 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	8.1E 01 3.7E 01	6.9E-01 3.1E-01	2.5E 01 LTR 9.4E 01 GAL
RESORCINOL	1.5E 03 3.4E 03	2.1E 02 9.0E 02	2.0E 03 9.7E 03	2.3E 02 KG 5.0E 02 LB	9.8 00 4.5 00	1.3E 01 5.9E 00	9.3E-01 4.2E-01	5.5E 00 2.5E 00	6.7E-02 3.0E-02	1.6E 00 KG 7.3E-01 LB
SELENIC ACID	1.1E 03 2.5E 03	3.7E 01 8.2E 01	1.9E 03 4.3E 03	2.3E 01 KG 5.0E 01 LB	1.4 01 6.5 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	7.4E 01 3.4E 01	1.3E-01 6.0E-02	2.3E 01 KG 1.0E 01 LB
SELENIUM OXIDE	5.5E 02 1.2E 03	3.7E 01 8.2E 01	8.9E 02 2.0E 03	2.3E 01 KG 5.0E 01 LB	1.5 01 6.9 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	7.4E 01 3.4E 01	2.9E-01 1.3E-01	2.3E 01 KG 1.0E 01 LB
SEVIN (PURE)	2.9E 02 6.5E 02	4.1E 02 9.0E 02	5.0E 02 1.1E 03	2.3E 02 KG 5.0E 02 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	6.1E 00 2.8E 00	3.5E-01 1.6E-01	1.8E 00 KG 8.1E-01 LB
SEVIN (SETTABLE)	2.9E 02 6.5E 02	4.1E 02 9.0E 02	5.0E 02 1.1E 03	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	9.2E 00 4.2E 00	5.1E-01 2.3E-01	2.7E 00 KG 1.2E 00 LB
SODIUM	2.5E 03 5.5E 03	4.1E 03 9.0E 03	4.2E 03 9.3E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	7.3E-01 3.3E-01	6.0E-02 2.7E-02	2.2E-01 KG 9.8E-02 LB
SODIUM ARSENATE	1.2E 03 2.7E 03	3.7E 01 8.2E 01	2.1E 03 4.6E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.1E 02 4.9E 01	1.2E-01 5.6E-02	3.3E 01 KG 1.5E 01 LB
SODIUM ARSENITE	1.5E 03 3.4E 03	3.7E 01 8.2E 01	2.0E 03 9.7E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.1E 02 4.9E 01	9.8E-02 4.5E-02	3.3E 01 KG 1.5E 01 LB
SODIUM BICHROMATE	9.4E 03 2.1E 04	2.2E 04 4.9E 04	1.6E 04 3.5E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.2E 00	1.5E 01 6.9E 00	1.1E 00 5.0E-01	1.7E-01 7.6E-02	1.5E-02 6.9E-03	5.0E-02 KG 2.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
SODIUM BIFLUORIDE	2.2E 02 4.8E 02	4.1E 02 9.0E 02	3.7E 02 8.2E 02	2.3E 02 KG 5.0E 02 LB	1.9E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	9.2E 00 4.2E 00	6.9E-01 3.1E-01	2.7E 00 KG 1.2E 00 LB
SODIUM BISULFITE	1.1E 04 2.5E 04	2.2E 04 4.9E 04	1.0E 04 2.4E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.0E-01	1.0E-01 4.6E-02	1.4E-02 6.5E-03	3.8E-02 KG 1.3E-02 LB
SODIUM CHROMATE	1.3E 04 2.9E 04	2.2E 04 4.9E 04	2.2E 04 4.9E 04	1.5E 04 KG 3.2E 04 LB	1.0E 01 4.7E 00	1.4E 01 6.3E 00	9.6E-01 4.5E-01	1.7E-01 7.6E-02	1.1E-02 5.2E-03	5.0E-02 KG 2.2E-02 LB
SODIUM CYANIDE	9.0E 00 1.5E 01	3.7E 01 8.2E 01	1.1E 01 2.5E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 9.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	6.1E 01 2.8E 01	2.2E 01 9.8E 00	1.8E 01 KG 8.4E 00 LB
SODIUM DODECYLBENZENE SULFONATE	8.5E 02 1.8E 03	4.1E 03 9.0E 03	1.4E 03 3.1E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	5.5E-01 2.5E-01	1.8E-01 8.2E-02	1.0E-01 KG 7.3E-02 LB
SODIUM FLUORIDE	2.9E 02 6.5E 02	4.1E 02 9.2E 02	5.0E 02 1.1E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.0E-01	9.2E 00 4.2E 00	5.1E-01 2.3E-01	2.7E 00 KG 1.2E 00 LB
SODIUM HYDRO-SULFIDE	4.9E 02 9.7E 02	4.1E 03 9.0E 03	7.4E 02 1.6E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	5.9E-01 2.5E-01	3.4E-01 1.6E-01	1.0E-01 KG 7.3E-02 LB
SODIUM HYDROXIDE	4.3E 03 9.6E 03	4.1E 03 9.0E 03	7.4E 03 1.6E 04	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.7E 00	1.4E 01 6.2E 00	9.7E-01 4.4F-01	5.5E-01 2.5E-01	3.5E-02 1.6E-02	1.0E-01 KG 7.3E-02 LB
SODIUM HYPOCHLORITE	9.2E 00 2.0E 01	3.7E 01 8.2E 01	1.6E 01 3.4E 01	2.3E 01 KG 5.0E 01 LB	1.1E 01 5.0E 00	1.5E 01 6.6E 00	1.0E 00 4.7E-01	8.1E 01 3.7E 01	1.5E 01 7.0E 02	2.5E 01 KG 1.1E 01 LB
SODIUM METHYLATE	5.9E 03 1.3E 04	2.2E 04 4.9E 04	1.7E 04 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.6E 00	1.6E 01 7.5E 00	1.2E 00 5.3E-01	1.3E-01 6.1E-02	2.6E-02 1.2E-02	6.0E-02 KG 1.9E-02 LB
SODIUM NITRITE	3.3E 02 7.3E 02	4.1E 02 9.0E 02	5.6E 02 1.2E 03	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	5.5E 00 2.5E 00	4.0E-01 2.1E-01	1.0E 00 KG 7.3E-01 LB
SODIUM PHOSPHATE MONOBASIC	3.2E 04 7.0E 04	2.2E 04 4.9E 04	5.4E 04 1.2E 05	1.5E 04 KG 3.2E 04 LB	8.4E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.4E-01 6.0E-02	4.8E-03 2.2E-03	3.0E-02 KG 1.3E-02 LB
SODIUM PHOSPHATE DIBASIC	1.9E 04 4.1E 04	2.2E 04 4.9E 04	3.2E 04 7.0E 04	1.5E 04 KG 3.2E 04 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	1.0E-01 4.6E-02	7.6E-03 3.4E-03	3.0E-02 KG 1.3E-02 LB
SODIUM PHOSPHATE TRIBASIC	4.4E 03 1.5E 04	2.2E 04 4.9E 04	1.1E 04 2.5E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	1.0E-01 4.6E-02	2.3E-02 1.0E-02	3.0E-02 KG 1.3E-02 LB
SODIUM SELENITE	2.0E 03 5.3E 03	3.7E 01 8.2E 01	4.1E 03 9.0E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	7.4E 01 3.4E 01	6.2E-02 2.8E-02	2.3E 01 KG 1.0E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY IOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
SODIUM SULFIDE	2.7E 03 5.9E 03	4.1E 03 9.0E 03	4.5E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.2E 01	1.0E 01 2.2E 01	1.3E 00 2.9E-01	5.5E-01 1.2E+00	5.6E-02 1.2E-01	1.6E-01 KG 3.5E-01 LB
SODIUM CHROMATE	7.9E 03 1.7E 04	2.2E 04 4.9E 04	1.3E 04 2.9E 04	1.5E 04 KG 3.2E 04 LB	1.0E 01 2.2E 01	1.4E 01 3.1E 01	9.9E-01 2.2E 00	1.1E+01 2.4E+01	1.3E-02 2.9E-02	1.3E-02 KG 2.9E-02 LB
STRYCHNINE	1.2E 03 2.7E 03	4.1E 02 9.0E 02	2.1E 03 4.6E 03	2.3E 02 KG 5.0E 02 LB	1.1E 01 2.4E 01	1.5E 01 3.3E 01	1.1E 00 2.4E+00	6.1E 00 1.3E+01	8.4E-02 1.8E-01	1.8E 00 KG 4.0E+00 LB
STYRENE	9.7E 02 2.1E 03	4.1E 03 9.0E 03	1.8E 03 3.9E 03	2.1E 03 LTR 4.5E 02 GAL	1.4E 01 3.1E 01	1.4E 01 3.1E 01	9.9E-01 2.2E 00	2.4E+01 5.2E+01	3.7E-02 8.1E-02	7.2E-02 LTR 1.6E-01 GAL
SULFURIC ACID	5.4E 03 1.2E 04	4.1E 03 9.0E 03	9.1E 03 2.0E 04	2.3E 03 KG 5.0E 03 LB	9.8E 00 2.2E 01	1.3E 01 2.9E 01	9.5E-01 2.1E 00	5.5E-01 1.2E+00	3.3E-02 7.3E-02	1.6E-01 KG 3.5E-01 LB
SULFUR MONOCHLORIDE	3.4E 03 7.5E 03	4.1E 03 9.0E 03	6.4E 03 1.4E 04	2.3E 03 KG 5.0E 03 LB	9.9E 00 2.2E 01	1.3E 01 2.9E 01	9.4E-01 2.1E 00	7.3E-01 1.6E+00	4.8E-02 1.1E-01	2.2E-01 KG 4.9E-01 LB
2,4,5-T ACID (PURE)	4.4E 02 1.0E 03	4.1E 02 9.0E 02	4.2E 02 1.0E 03	2.3E 02 KG 5.0E 02 LB	1.1E 01 2.4E 01	1.9E 01 4.2E 01	1.8E 00 4.0E+00	3.7E 00 8.1E+00	2.1E-01 4.7E-01	1.1E 00 KG 2.4E+00 LB
2,4,5-T ACID (-ESTERS)	4.4E 02 1.0E 03	4.1E 02 9.0E 02	6.2E 02 1.4E 03	2.3E 02 KG 5.0E 02 LB	1.2E 01 2.7E 01	1.7E 01 3.9E 01	1.2E 00 2.6E+00	5.5E 00 1.2E+01	3.1E-01 7.0E-01	1.6E 00 KG 3.6E+00 LB
2,4,5-T ESTERS (PURE)	7.5E 02 1.6E 03	4.1E 03 9.0E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.0E 03 LB	1.1E 01 2.4E 01	1.9E 01 4.2E 01	1.8E 00 4.0E+00	3.7E+01 8.1E+01	1.4E+01 3.1E+01	1.1E+01 KG 2.4E+01 LB
2,4,5-T ESTERS (-ETTABLE)	7.5E 02 1.6E 03	4.1E 03 9.0E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.8E 01	1.7E 01 3.8E 01	1.2E 00 2.7E+00	5.9E-01 1.3E+00	2.0E-01 4.5E-01	1.6E-01 KG 3.6E+00 LB
TANNIC ACID	1.9E 03 4.1E 03	4.1E 03 9.0E 03	2.0E 03 4.4E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 01	1.9E 01 4.2E 01	1.3E 00 2.9E+00	9.4E-01 2.1E+00	8.7E-02 1.9E-01	2.9E-01 KG 6.4E-01 LB
TDE (PURE)	1.4E 00 3.1E 00	3.7E 01 8.2E 01	3.1E 00 6.9E 00	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.1E 01	2.7E 01 6.0E 01	1.9E 00 4.2E+00	1.4E 02 3.1E+02	5.6E 01 1.2E+02	4.3E 01 KG 9.5E+01 LB
TDE (-ETTABLE)	1.4E 00 3.1E 00	3.7E 01 8.2E 01	3.1E 00 6.9E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 4.0E 01	2.3E 01 5.1E 01	1.7E 00 3.8E+00	2.1E 02 4.6E+02	8.2E 01 1.8E+02	6.4E 01 KG 1.4E+02 LB
TETRAETHYL LEAD	8.4E 00 1.9E 01	3.7E 01 8.2E 01	1.5E 01 3.3E 01	1.9E 01 LTR 5.0E 00 GAL	1.5E 01 3.3E 01	2.1E 01 4.6E 01	1.5E 00 3.3E+00	6.7E 01 1.5E+02	2.1E 01 4.6E+01	2.1E 01 LTR 5.0E+01 GAL
TETRAETHYL PYROPHOSPHATE	3.7E 01 8.1E 01	3.7E 01 8.2E 01	6.2E 01 1.4E 02	1.9E 01 LTR 5.0E 00 GAL	1.1E 01 2.5E 01	1.4E 01 3.1E 01	1.0E 00 2.2E+00	8.1E 01 1.8E+02	4.0E 00 8.8E+00	2.5E 01 LTR 5.6E 01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
TOLUENE	1.1E 03 2.3E 03	4.1E 03 9.0E 03	1.4E 03 3.1E 03	2.1E 03 LTN 5.5E 02 GAL	1.2E 01 5.0E 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	2.4E-01 1.1E-01	9.8E-02 4.4E-02	7.2E-02 LTN 2.7E-01 GAL
TOXAPHENE (PURE)	1.5E-01 3.3E-01	3.7E 01 8.2E 01	2.6E-01 5.7E-01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	6.7E 01 3.1E 01	2.8E 03 1.2E 03	2.1E 01 KG 9.3E 00 LB
TOXAPHENE (WETTABLE)	1.5E-01 3.4E-01	3.7E 01 8.2E 01	2.6E-01 5.7E-01	2.3E 01 KG 5.0E 01 LB	1.6E 01 6.9E 00	2.0E 01 1.1E 01	1.7E 00 7.6E-01	1.9E 02 6.6E 01	2.6E 03 1.2E 03	3.1E 01 KG 1.4E 01 LB
TRICHLORFON	7.9E 03 1.7E 04	2.2E 04 4.9E 04	1.3E 04 2.9E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	1.7E-01 7.6E-02	1.9E-02 8.7E-03	5.9E-02 KG 2.2E-02 LB
TRICHLOROPHENOL	4.4E 02 9.7E 02	1.7E 01 8.2E 01	7.4E 00 1.6E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	4.3E 01 1.8E 01	2.3E 01 1.1E 01	1.2E 01 KG 5.0E 00 LB
TRIETHANOLAMINE DODECYLBENZENE SULFONATE	9.7E 02 2.1E 03	4.1E 03 9.0E 03	1.6E 03 3.4E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.0E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	5.5E-01 2.5E-01	1.6E-01 7.1E-02	1.6E-01 KG 7.3E-02 LB
TRIETHYLAMINE	3.5E 03 7.7E 03	4.1E 03 9.0E 03	5.9E 03 1.3E 04	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.8E 01 8.3E 00	1.3E 00 6.0E-01	4.3E-01 1.9E-01	5.3E-02 2.3E-02	1.3E-01 KG 5.7E-02 LB
TRIMETHYLAMINE	2.1E 03 4.6E 03	4.1E 03 9.0E 03	3.6E 03 7.9E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.5E 00	1.6E 01 7.3E 00	1.2E 00 5.2E-01	4.3E-01 1.9E-01	7.2E-02 3.3E-02	1.3E-01 KG 5.7E-02 LB
URANIUM PEROXIDE	4.7E 03 1.0E 04	2.2E 04 4.9E 04	8.0E 03 1.8E 04	1.5E 04 KG 3.2E 04 LB	8.0E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.1E-01 5.1E-02	2.2E-02 9.9E-03	3.3E-02 KG 1.5E-02 LB
URANYL ACETATE	7.0E 03 1.5E 04	2.2E 04 4.9E 04	1.3E 04 2.9E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	1.7E-01 7.6E-02	1.6E-02 7.3E-03	5.0E-02 KG 2.2E-02 LB
URANYL NITRATE	4.5E 03 1.0E 04	2.2E 04 4.9E 04	1.1E 04 2.4E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.5E-01	1.7E-01 7.6E-02	1.9E-02 8.7E-03	5.0E-02 KG 2.2E-02 LB
URANYL SULFATE	5.9E 03 1.3E 04	2.2E 04 4.9E 04	1.0E 04 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.0E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.7E-01 7.6E-02	2.1E-02 9.6E-03	5.0E-02 KG 2.2E-02 LB
VANADIUM OXYTRICHLORIDE	4.6E 03 1.0E 04	2.2E 04 4.9E 04	7.7E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.2E 00 4.9E-01	1.1E-01 5.1E-02	2.3E-02 1.0E-02	3.3E-02 KG 1.5E-02 LB
VANADIUM PENTOXIDE	2.4E 03 5.3E 03	4.1E 03 9.0E 03	4.1E 03 9.0E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	9.2E-01 4.2E-01	5.2E-02 2.4E-02	2.7E-01 KG 1.2E-01 LB
VANADYL SULFATE	2.4E 03 5.3E 03	4.1E 03 9.0E 03	4.1E 03 9.0E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	9.2E-01 4.2E-01	5.2E-02 2.4E-02	2.7E-01 KG 1.2E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
VINYL ACETATE	7.9E 02 1.7E 03	4.1E 03 9.0E 03	1.3E 03 2.9E 03	2.1E 03 LTR 9.5E 02 GAL	1.3E 01 5.7E 01	1.7E 01 7.6E 00	1.2E 00 5.0E-01	7.3E-01 3.3E-01	1.9E-01 8.8E-02	2.2E-01 LTR 8.2E-01 GAL
XYLENE	9.7E 02 2.1E 03	4.1E 03 9.0E 03	1.0E 03 3.0E 03	2.1E 03 LTR 9.5E 02 GAL	1.3E 01 5.9E 01	1.7E 01 7.9E 00	1.2E 00 5.7E-01	4.3E-01 1.9E-01	1.1E-01 5.2E-02	1.3E-01 LTR 6.0E-01 GAL
XYLENOL	1.4E 03 3.0E 03	4.1E 03 9.0E 03	2.7E 03 5.9E 03	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 5.5E 01	1.6E 01 7.3E 00	1.2E 00 5.2E-01	5.5E-01 2.5E-01	9.5E-02 4.3E-02	1.6E-01 LTR 6.1E-01 GAL
ZECTRAN (PURE)	8.9E 02 1.1E 03	4.1E 03 9.0E 03	8.3E 02 1.8E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.5E 01	1.6E 01 7.3E 00	1.1E 00 5.2E-01	6.1E-01 2.8E-01	2.1E-01 9.5E-02	1.8E-01 KG 8.2E-02 LB
ZECTRAN (WETTABLE)	8.9E 02 1.1E 03	4.1E 03 9.0E 03	8.3E 02 1.8E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 01	1.9E 01 8.7E 00	1.4E 00 6.2E-01	9.2E-01 4.2E-01	3.1E-01 1.4E-01	2.7E-01 KG 1.2E-01 LB
ZINC ACETATE	1.8E 03 4.1E 03	4.1E 03 9.0E 03	3.1E 03 6.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 01	1.9E 01 8.4E 00	1.3E 00 6.0E-01	9.2E-01 4.2E-01	6.8E-02 3.1E-02	2.7E-01 KG 1.2E-01 LB
ZINC AMMONIUM CHLORIDE	1.0E 03 3.8E 03	4.1E 03 9.0E 03	2.0E 03 6.1E 03	2.3E 03 KG 5.0E 03 LB	8.4E 00 4.0E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	9.2E-01 4.2E-01	7.7E-02 3.5E-02	2.7E-01 KG 1.2E-01 LB
ZINC BICHROMATE	2.8E 03 6.2E 03	4.1E 03 9.0E 03	4.8E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.5E 01	1.6E 01 7.4E 00	1.2E 00 5.3E-01	6.1E-01 2.8E-01	4.5E-02 2.0E-02	1.8E-01 KG 8.2E-02 LB
ZINC BORATE	1.1E 03 2.3E 03	4.1E 03 9.0E 03	1.8E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	9.2E-01 4.2E-01	1.2E-01 5.4E-02	2.7E-01 KG 1.2E-01 LB
ZINC HYDRIDE	1.9E 03 4.2E 03	4.1E 03 9.0E 03	3.2E 03 7.0E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	9.2E-01 4.2E-01	6.7E-02 3.0E-02	2.7E-01 KG 1.2E-01 LB
ZINC CARBONATE	1.1E 03 2.3E 03	4.1E 03 9.0E 03	1.8E 03 3.9E 03	2.3E 03 KG 5.0E 03 LB	8.4E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	6.1E-01 2.8E-01	9.8E-02 4.4E-02	1.8E-01 KG 8.2E-02 LB
ZINC CHLORIDE	1.1E 03 2.5E 03	4.1E 03 9.0E 03	1.9E 03 4.3E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	9.2E-01 4.2E-01	1.1E-01 5.0E-02	2.7E-01 KG 1.2E-01 LB
ZINC CYANIDE	7.9E 00 1.7E 01	5.7E 01 9.2E 01	1.3E 01 2.9E 01	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	6.1E 01 2.8E 01	1.3E 01 5.9E 00	1.8E 01 KG 8.4E 00 LB
ZINC FLOURIDE	6.1E 02 1.4E 03	4.1E 03 9.0E 03	1.0E 03 2.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	9.2E-01 4.2E-01	2.0E-01 9.3E-02	2.7E-01 KG 1.2E-01 LB
ZINC FORMATE	1.3E 03 2.9E 03	4.1E 03 9.0E 03	2.2E 03 4.9E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	9.2E-01 4.2E-01	9.6E-02 4.3E-02	2.7E-01 KG 1.2E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR RIVERS

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ZINC HYDROSULFITE	1.7E 03 3.7E 03	4.1E 03 9.0E 03	2.0E 03 4.2E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.2E 00	1.0E 01 2.3E 00	1.3E 00 2.9E-01	9.2E-01 2.0E-01	7.5E-02 1.6E-02	2.7E-01 KG 6.0E-01 LB
ZINC NITRATE	2.5E 03 5.5E 03	4.1E 03 9.0E 03	4.2E 03 9.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.2E 00	1.0E 01 2.3E 00	1.3E 00 2.9E-01	9.2E-01 2.0E-01	5.0E-02 1.1E-02	2.7E-01 KG 6.0E-01 LB
ZINC PERMANGANATE	3.5E 03 7.8E 03	4.1E 03 9.0E 03	5.9E 03 1.3E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.9E 00	1.7E 01 3.9E 00	1.2E 00 2.6E-01	9.2E-01 2.0E-01	3.6E-02 8.0E-03	2.7E-01 KG 6.0E-01 LB
ZINC PHENOL-SULFONATE	6.7E 03 1.5E 04	2.2E 04 4.9E 04	8.0E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 2.9E 00	1.7E 01 3.8E 00	1.2E 00 2.5E-01	1.7E-01 3.8E-02	2.7E-02 6.0E-03	5.0E-02 KG 1.1E-01 LB
ZINC PHOSPHIDE	7.5E 02 1.6E 03	4.1E 03 9.0E 03	1.3E 03 2.8E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.8E 00	1.0E 01 2.2E 00	1.3E 00 2.7E-01	6.1E-01 1.3E-01	1.4E-01 3.1E-02	1.0E-01 KG 2.2E-01 LB
ZINC POTASSIUM CHROMATE	3.2E 03 7.0E 03	4.1E 03 9.0E 03	5.4E 03 1.2E 04	2.3E 03 KG 5.0E 03 LB	1.1E 01 2.5E 00	1.5E 01 3.4E 00	1.1E 00 2.5E-01	6.1E-01 1.3E-01	5.3E-02 1.2E-02	1.4E-01 KG 3.1E-01 LB
ZINC PROPIONATE	1.4E 03 3.2E 03	4.1E 03 9.0E 03	3.4E 03 6.7E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 00	1.0E 01 2.2E 00	1.3E 00 2.9E-01	9.2E-01 2.0E-01	7.0E-02 1.5E-02	2.7E-01 KG 6.0E-01 LB
ZINC SILICOFLUORIDE	2.7E 03 5.9E 03	4.1E 03 9.0E 03	4.5E 03 1.0E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.9E 00	1.0E 01 2.2E 00	1.3E 00 2.8E-01	9.2E-01 2.0E-01	6.7E-02 1.5E-02	2.7E-01 KG 6.0E-01 LB
ZINC SULFATE	2.4E 03 5.3E 03	4.1E 03 9.0E 03	4.1E 03 9.0E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.0E 00	1.9E 01 4.2E 00	1.3E 00 2.8E-01	9.2E-01 2.0E-01	5.2E-02 1.1E-02	2.7E-01 KG 6.0E-01 LB
ZIRCONIUM ACETATE	1.3E 04 3.0E 04	2.2E 04 4.9E 04	2.3E 04 5.2E 04	1.5E 04 KG 3.2E 04 LB	1.0E 01 2.2E 00	1.4E 01 3.1E 00	9.8E-01 2.2E-01	1.7E-01 3.8E-02	9.3E-03 2.0E-03	5.0E-02 KG 1.1E-01 LB
ZIRCONIUM NITRATE	2.4E 04 5.2E 04	2.2E 04 4.9E 04	4.2E 04 8.9E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 1.9E 00	1.2E 01 2.7E 00	8.4E-01 1.9E-01	1.7E-01 3.8E-02	5.3E-03 1.2E-03	5.0E-02 KG 1.1E-01 LB
ZIRCONIUM OXY-CHLORIDE	4.2E 04 9.4E 04	2.2E 04 4.9E 04	7.2E 04 1.6E 05	1.5E 04 KG 3.2E 04 LB	8.8E 00 1.9E 00	1.2E 01 2.7E 00	8.4E-01 1.9E-01	1.7E-01 3.8E-02	3.0E-03 6.7E-04	5.0E-02 KG 1.1E-01 LB
ZIRCONIUM POTASSIUM FLUORIDE	3.2E 02 7.2E 02	4.1E 02 9.0E 02	5.4E 02 1.2E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.4E 00	2.0E 01 4.5E 00	1.4E 00 3.2E-01	9.2E 00 2.0E 00	4.0E-01 9.0E-02	2.7E 00 KG 6.0E 00 LB
ZIRCONIUM SULFATE	2.0E 04 4.3E 04	2.2E 04 4.9E 04	3.3E 04 7.3E 04	1.5E 04 KG 3.2E 04 LB	9.2E 00 2.0E 00	1.2E 01 2.6E 00	8.7E-01 1.9E-01	1.7E-01 3.8E-02	6.0E-03 1.3E-03	5.0E-02 KG 1.1E-01 LB
ZIRCONIUM TETRA-CHLORIDE	6.4E 03 1.4E 04	4.1E 03 9.0E 03	1.1E 04 2.4E 04	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.7E 00	1.6E 01 3.5E 00	1.1E 00 2.5E-01	9.2E-01 2.0E-01	2.0E-02 4.5E-03	2.7E-01 KG 6.0E-01 LB

TABLE N-3

SUMMARY OF HARMFUL QUANTITIES
AND RATES OF PENA.TY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RA... $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ACETALDEHYDE	1.9E 05 4.3E 05	2.7E 03 6.0E 03	3.4E 03 7.5E 03	2.1E 03 LTR 5.5E 02 GAL	1.0E 00 2.5E 00	1.3E 01 5.9E 00	9.3E-01 4.2E-01	5.6E-01 2.6E-01	2.4E-01 1.1E-01	1.1E-01 LTR 4.1E-01 GAL
ACETIC ACID	8.9E 04 2.0E 05	2.7E 03 5.9E 03	1.6E 03 3.6E 03	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 2.9E 00	1.4E 01 6.5E 00	1.0E 00 4.6E-01	8.4E-01 3.8E-01	5.1E-01 2.3E-01	1.6E-01 LTR 6.1E-01 GAL
ACETIC ANHYDRIDE	7.4E 04 1.7E 05	2.7E 03 5.9E 03	1.4E 03 3.2E 03	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 2.8E 00	1.4E 01 6.4E 00	1.0E 00 4.6E-01	8.4E-01 3.8E-01	4.8E-01 2.2E-01	1.6E-01 LTR 6.1E-01 GAL
ACETONE CYANOHYDRIN	1.4E 05 1.1E 05	2.7E 03 5.9E 03	2.0E 03 5.1E 03	2.1E 03 LTR 5.5E 02 GAL	1.4E 01 3.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.1E 00 6.0E-01	2.7E-01 1.2E-01	2.5E-01 LTR 9.5E-01 GAL
ACETYL BROMIDE	1.9E 04 4.1E 04	1.5E 04 3.2E 04	3.3E 04 7.2E 04	1.5E 04 LTR 4.0E 03 GAL	6.8E 00 1.6E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.9E-01 8.6E-02	2.6E-02 1.2E-02	5.6E-02 LTR 1.4E-01 GAL
ACETYL CHLORIDE	1.3E 04 2.8E 04	1.5E 04 3.2E 04	2.3E 04 5.0E 04	1.5E 04 LTR 4.0E 03 GAL	9.9E 00 2.2E 01	1.2E 01 5.4E 00	8.5E-01 3.9E-01	1.5E-01 7.0E-02	3.7E-02 1.7E-02	3.9E-02 LTR 1.1E-01 GAL
ACROLEIN	1.5E 02 3.4E 02	2.4E 01 5.3E 01	2.7E 00 5.9E 00	1.9E 01 LTR 5.3E 00 GA	1.4E 01 3.2E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	6.2E 01 2.8E 01	2.5E 02 1.1E 02	1.2E 01 LTR 4.7E 01 GA
ACRYLONITRILE	6.1E 04 1.3E 05	2.7E 03 5.9E 03	1.1E 03 2.4E 03	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 2.8E 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	1.0E 00 4.7E-01	6.1E-01 2.8E-01	2.0E-01 LTR 7.5E-01 GAL
ADIPONITRILE	2.3E 04 5.1E 04	1.5E 04 3.2E 04	4.0E 04 8.8E 04	1.5E 04 LTR 4.0E 03 GAL	6.8E 00 1.6E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.2E-01 5.5E-02	1.6E-02 7.5E-03	2.3E-02 LTR 9.7E-02 GAL
ALDRIN (PURE)	6.9E 01 1.5E 02	2.4E 01 5.3E 01	1.2E 00 2.7E 00	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.1E 00	1.9E 01 8.4E 00	1.3E 00 6.0E-01	3.4E 02 1.5E 02	1.4E 03 6.3E 02	6.8E 01 KG 1.1E 01 LB
ALDRIN (FORMULATED)	6.9E 01 1.5E 02	2.4E 01 5.3E 01	1.2E 00 2.7E 00	2.3E 01 KG 5.0E 01 LB	1.0E 01 2.2E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	3.7E 02 1.7E 02	1.1E 03 4.9E 02	7.4E 01 KG 1.3E 01 LB
ALLYL ALCOHOL	1.4E 04 3.1E 04	2.7E 02 5.9E 02	2.4E 02 5.3E 02	2.1E 02 LTR 5.5E 01 GAL	1.5E 01 3.2E 00	2.0E 01 9.2E 00	1.5E 00 6.6E-01	5.0E 00 2.4E 00	2.7E 00 1.2E 00	1.1E 01 LTR 4.1E 00 GAL
ALLYL CHLORIDE	6.7E 03 1.5E 04	2.7E 02 5.9E 02	1.2E 02 2.6E 02	2.1E 02 LTR 5.5E 01 GAL	1.5E 01 3.2E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	8.4E 00 3.8E 00	1.9E 00 8.6E-01	1.6E 00 LTR 6.1E 00 GAL
ALUMINUM FLUORIDE	5.5E 05 1.2E 06	1.5E 04 3.2E 04	9.7E 03 2.1E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.5E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	3.1E-01 1.4E-01	1.1E-01 4.9E-02	5.9E-02 KG 2.7E-02 LB
ALUMINUM SULFATE	6.9E 05 1.5E 06	1.5E 04 3.2E 04	1.2E 04 2.7E 04	1.5E 04 KG 3.2E 04 LB	9.1E 01 2.0E 00	1.5E 01 6.6E 00	1.0E 00 4.7E-01	3.1E-01 1.4E-01	8.6E-02 3.9E-02	5.9E-02 KG 2.7E-02 LB

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SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIA	9.0E 01 2.1E 02	2.7E 02 9.9E 02	1.7E 02 5.4E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.2E 00	2.1E 01 9.6E 00	1.5E 00 6.8E-01	5.0E 00 2.0L 00	6.0E 00 1.8E 00	1.1E 00 KG 4.9E-01 LB
AMMONIUM ACETATE	6.0E 03 1.5E 04	1.5E 04 3.2E 04	1.2E 04 2.5E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	1.5E-01 7.0E-02	5.0E-02 2.0E-02	3.0E-02 KG 1.3E-02 LB
AMMONIUM BENZOATE	1.2E 04 2.4E 04	1.5E 04 3.2E 04	2.1E 04 4.4E 04	1.5E 04 KG 3.2E 04 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	1.9E-01 8.0L-02	6.0E-02 1.8E-02	3.0L-02 KG 1.4E-02 LB
AMMONIUM BICARBONATE	6.7E 02 1.5E 03	2.7E 03 5.9E 03	1.2E 03 2.6E 03	2.3E 03 KG 5.4E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.8E 00 8.7E-01	7.2E-01 3.3E-01	2.9E-01 KG 9.8E-02 LB
AMMONIUM BICHROMATE	3.5E 03 7.7E 03	1.5E 04 3.2E 04	6.1E 03 1.3E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	1.9E-01 8.6F-02	1.4E-01 6.2E-02	5.0E-02 KG 1.6E-02 LB
AMMONIUM BIFLUORIDE	2.4E 03 6.1E 03	1.5E 04 3.2E 04	4.9E 03 1.1E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	1.9E-01 8.6E-02	1.7E-01 7.9E-02	5.0E-02 KG 1.4E-02 LB
AMMONIUM BISULFITE	9.4E 03 2.2E 04	1.5E 04 3.2E 04	1.7E 04 3.8E 04	1.5E 04 KG 3.2E 04 LB	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	1.9E-01 8.6E-02	6.9E-02 2.2E-02	5.0E-02 KG 1.4E-02 LB
AMMONIUM BROMIDE	3.1E 04 6.7E 04	2.7E 03 5.9E 03	5.3E 02 1.2E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.5E-01	1.0E 00 4.7L-01	1.4E 00 7.1E-01	2.7E-01 KG 9.2E-02 LB
AMMONIUM CARBAMATE	2.5E 04 5.5E 04	2.7E 02 5.9E 02	4.4L 02 9.6E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E 01 4.7E 00	1.9E 00 8.7E-01	2.2E 00 KG 9.0E-01 LB
AMMONIUM CARBONATE	9.7E 04 2.1E 05	1.5E 04 3.2E 04	1.7E 03 3.7E 03	1.5E 04 KG 3.2E 04 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.9E-01 8.6E-02	6.9E-01 2.2E-01	3.0E-02 KG 1.0E-02 LB
AMMONIUM CHLORIDE	1.7E 04 3.7E 04	2.7E 02 5.9E 02	2.9E 02 6.4E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E 01 4.7E 00	2.9E 00 1.3E 00	2.7E 00 KG 9.0E-01 LB
AMMONIUM CHROMATE	6.7E 05 1.5E 06	1.5E 04 3.2E 04	1.2E 04 2.6E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.6E-01	1.9E-01 8.6E-02	7.2E-02 3.3E-02	3.0E-02 KG 1.0E-02 LB
AMMONIUM CITRATE,	9.9E 03 2.2E 04	1.5E 04 3.2E 04	1.7E 04 3.8E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.9E-01 8.6E-02	6.8E-02 2.2E-02	5.0E-02 KG 1.4E-02 LB
AMMONIUM FLUORALUMINATE	3.5E 04 7.3E 04	2.7E 03 5.9E 03	5.8E 02 1.3E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.0E 00 4.7E-01	1.4E 00 6.5E-01	2.9E-01 KG 9.0E-02 LB
AMMONIUM FLUORIDE	5.5E 05 1.2E 06	1.5E 04 3.2E 04	9.7E 03 2.1E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	1.9E-01 8.6E-02	6.6E-02 3.9E-02	3.0L-02 KG 1.0E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIUM FORMATE	5.4E 05 1.2E 06	1.5E 04 3.2E 04	9.5E 03 2.1E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	1.9E-01 8.6E-02	7.1E-02 3.2E-02	3.0E-02 KG 1.4E-02 LB
AMMONIUM MERCURIC	4.2E 00 9.2E 00	2.7E 03 5.9E 03	7.3E 02 1.6E 03	2.1E 03 LTN 5.5E 02 GAL	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 01 6.3E-01	1.9E 00 4.7E-01	9.0E-01 4.1E-01	2.0E-01 LTN 7.5E-01 GAL
AMMONIUM HYPOPHOSPHITE	2.6E 04 5.7E 04	2.7E 02 5.9E 02	4.6E 02 1.0E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.9E 01 4.7E 00	1.8E 00 8.4E-01	2.0E 00 KG 9.0E-01 LB
AMMONIUM IODIDE	4.4E 04 9.8E 04	2.7E 03 5.9E 03	7.8E 02 1.7E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.8E 00 4.7E-01	8.6E-01 3.9E-01	2.0E-01 KG 9.0E-02 LB
AMMONIUM MOLYBDATE	3.1E 04 6.7E 04	2.7E 03 5.9E 03	5.3E 02 1.2E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.7E 00 4.7E-01	1.3E 00 5.7E-01	2.0E-01 KG 9.0E-02 LB
AMMONIUM NITRATE	2.9E 04 6.3E 04	2.7E 02 5.9E 02	4.3E 02 9.5E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.6E 00	1.5E 00 6.7E-01	1.0E 01 4.7E 00	1.9E 00 8.6E-01	2.0E 00 KG 9.0E-01 LB
AMMONIUM OXALATE	6.1E 05 1.3E 06	1.5E 04 3.2E 04	1.1E 04 2.5E 04	1.5E 04 KG 3.2E 04 LB	9.2E 00 4.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	1.9E-01 8.6E-02	7.9E-02 3.6E-02	3.0E-02 KG 1.4E-02 LB
AMMONIUM PENTABORATE	8.3E 04 1.8E 05	2.7E 03 5.9E 03	1.5E 03 3.2E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	1.0E 00 4.7E-01	5.4E-01 2.6E-01	2.0E-01 KG 9.0E-02 LB
AMMONIUM PERSULFATE	3.6E 04 7.9E 04	2.7E 03 5.9E 03	6.3E 02 1.4E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	1.2E 00 4.7E-01	1.1E 00 4.8E-01	2.0E-01 KG 9.0E-02 LB
AMMONIUM SILICOFLUORIDE	1.4E 05 3.1E 05	2.7E 03 5.9E 03	2.4E 03 5.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.4E 00 4.7E-01	3.5E-01 1.6E-01	2.0E-01 KG 9.0E-02 LB
AMMONIUM SULFAMATE	5.6E 05 1.2E 06	1.5E 04 3.2E 04	9.9E 03 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.5E 01 7.1E 00	1.1E 00 5.0E-01	1.9E-01 8.6E-02	6.8E-02 3.1E-02	3.0E-02 KG 1.4E-02 LB
AMMONIUM SULFATE	2.2E 04 4.9E 04	2.7E 02 5.9E 02	3.9E 02 8.6E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.8E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	1.8E 01 4.7E 00	2.2E 00 9.8E-01	2.0E 00 KG 9.0E-01 LB
AMMONIUM SULFIDE	6.9E 05 1.5E 06	1.5E 04 3.2E 04	1.2E 04 2.7E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	1.9E-01 8.6E-02	7.0E-02 3.2E-02	3.0E-02 KG 1.4E-02 LB
AMMONIUM SULFITE	4.7E 05 1.5E 06	1.5E 04 3.2E 04	1.2E 04 2.6E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	1.9E-01 8.6E-02	7.2E-02 3.3E-02	3.0E-02 KG 1.4E-02 LB
AMMONIUM TARTRATE	7.9E 05 1.7E 06	1.5E 04 3.2E 04	1.4E 04 3.0E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.9E-01 8.6E-02	6.1E-02 2.8E-02	3.0E-02 KG 1.4E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIUM THIOCYANATE	9.2E 03 2.0E 04	1.5E 04 3.2E 04	5.9E 03 1.2E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 2.9E 01	1.7E 01 3.7E 01	1.2E 00 2.5E-01	1.9E-01 4.0E-02	1.2E-01 2.5E-02	3.0E-02 KG 1.0E-02 LB
AMMONIUM THIOSULFATE	7.3E 03 1.6E 04	1.5E 04 3.2E 04	1.3E 04 2.8E 04	1.3E 04 KG 3.2E 04 LB	1.1E 01 2.4E 01	1.9E 01 4.1E 01	1.0E 00 4.7E-01	1.9E-01 4.0E-02	9.2E-02 2.4E-02	3.0E-02 KG 1.0E-02 LB
AMYL ACETATE	1.5E 03 5.2E 03	2.7E 03 5.9E 03	2.4E 03 5.7E 03	2.1E 03 LTK 5.5E 02 GAL	1.0E 01 2.2E 01	1.4E 01 3.3E 01	9.8E-01 4.5E-01	8.7E-01 2.1E-01	1.9E-01 8.5E-02	9.0E-02 LTK 3.0E-01 GAL
ANILINE	3.1E 04 4.7E 04	2.7E 03 5.9E 03	5.3E 02 1.2E 03	2.1E 03 LTK 5.5E 02 GAL	1.2E 01 2.5E 01	1.6E 01 7.1E 01	1.1E 00 5.0E-01	8.4E-01 3.8E-01	1.6E 00 7.1E-01	1.0E-01 LTK 4.1E-01 GAL
ANTIMONY PENTACHLORIDE	6.1E 04 1.3E 05	2.7E 03 5.9E 03	1.1E 03 2.4E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.9E 01	2.0E 01 9.1E 01	1.4E 00 6.5E-01	1.7E 00 7.7E-01	9.7E-01 4.4E-01	3.2E-01 KG 1.5E-01 LB
ANTIMONY PENTAFLUORIDE	4.4E 04 9.8E 04	2.7E 03 5.9E 03	7.8E 02 1.7E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.7E 01	2.0E 01 8.9E 01	1.4E 00 6.5E-01	1.7E 00 7.7E-01	1.3E 00 6.1E-01	3.2E-01 KG 1.5E-01 LB
ANTIMONY POTASSIUM TARTRATE	8.9E 04 2.0E 05	2.7E 03 5.9E 03	1.4E 03 3.1E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.6E 01	1.9E 01 8.8E 01	1.4E 00 6.3E-01	1.7E 00 7.7E-01	6.7E-01 3.0E-01	3.2E-01 KG 1.5E-01 LB
ANTIMONY TRIBROMIDE	7.5E 04 1.7E 05	2.7E 03 5.9E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.0E 03 LB	1.6E 01 3.6E 01	2.1E 01 9.4E 01	1.5E 00 6.7E-01	1.7E 00 7.7E-01	7.9E-01 3.6E-01	3.2E-01 KG 1.5E-01 LB
ANTIMONY TRICHLORIDE	6.7E 04 1.4E 05	2.7E 03 5.9E 03	8.3E 02 1.8E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.6E 01	2.0E 01 9.0E 01	1.4E 00 6.5E-01	1.7E 00 7.7E-01	1.3E 00 5.7E-01	3.2E-01 KG 1.5E-01 LB
ANTIMONY TRIFLUORIDE	3.4E 04 7.4E 04	2.7E 03 5.9E 03	6.3E 02 1.4E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.6E 01	2.0E 01 9.2E 01	1.4E 00 6.6E-01	1.7E 00 7.7E-01	1.0E 00 7.5E-01	3.2E-01 KG 1.5E-01 LB
ANTIMONY TRIIODIDE	1.2E 05 2.3E 05	2.7E 03 5.9E 03	1.9E 03 4.2E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.5E 01	1.9E 01 8.6E 01	1.4E 00 6.1E-01	1.7E 00 7.7E-01	9.8E-01 2.6E-01	3.2E-01 KG 1.5E-01 LB
ANTIMONY TRIOXIDE	2.9E 05 6.1E 05	1.5E 04 3.2E 04	4.9E 03 1.1E 04	1.5E 04 KG 3.2E 04 LB	1.3E 01 2.7E 01	1.7E 01 3.6E 01	1.2E 00 5.4E-01	3.1E-01 1.4E-01	2.1E-01 9.7E-02	9.9E-02 KG 2.7E-02 LB
ARSENIC ACID	1.2E 04 2.6E 04	2.4E 01 5.4E 01	2.1E 02 4.6E 02	1.9E 01 LTK 5.8E 00 GAL	1.6E 01 3.1E 01	2.1E 01 9.5E 01	1.5E 00 6.8E-01	1.9E 02 8.4E 01	5.2E 00 2.3E 00	1.7E 01 LTK 1.4E 02 GAL
ARSENIC DISULFIDE	1.1E 04 2.4E 04	2.4E 01 5.4E 01	1.9E 02 4.3E 02	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.2E 01	1.8E 01 8.3E 01	1.3E 00 5.9E-01	1.5E 02 7.8E 01	5.4E 00 2.5E 00	3.1E 01 KG 1.4E 01 LB
ARSENIC PENTAOXIDE	1.7E 04 3.7E 04	2.4E 01 5.4E 01	2.9E 02 6.4E 02	2.3E 01 KG 5.0E 01 LB	1.6E 01 3.1E 01	2.1E 01 9.5E 01	1.5E 00 6.8E-01	1.9E 02 8.4E 01	3.6E 00 1.6E 00	3.7E 01 KG 1.7E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ARSENIC TRIBROMIDE	3.3E 04 7.3E 04	2.4E 01 5.4E 01	5.0E 02 1.1E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.1E 01	1.4E 01 3.1E 01	1.3E 00 2.9E-01	1.9E 02 4.4E 01	1.0E 00 2.1E-01	3.7E 01 KG 1.7E 01 LB
ARSENIC TRICHLORIDE	2.1E 04 4.5E 04	2.4E 01 5.4E 01	3.0E 02 7.0E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	1.9E 01 4.0E 01	1.4E 00 3.3E-01	1.9E 02 4.4E 01	2.9E 00 1.3E 00	3.7E 01 KG 1.7E 01 LB
ARSENIC TRIFLUORIDE	1.7E 04 3.7E 04	2.4E 01 5.4E 01	2.9E 02 6.4E 02	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.2E 01	1.9E 01 4.2E 01	1.0E 00 2.2E-01	1.9E 02 4.4E 01	3.6E 00 1.6E 00	3.7E 01 KG 1.7E 01 LB
ARSENIC TRIIODIDE	5.7E 04 1.1E 05	2.4E 01 5.4E 01	8.7E 02 1.9E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	2.0E 01 4.3E 01	1.4E 00 3.3E-01	1.9E 02 4.4E 01	1.2E 00 5.4E-01	3.7E 01 KG 1.7E 01 LB
ARSENIC TRIOXIDE	1.1E 04 2.4E 04	2.4E 01 5.4E 01	1.9E 02 4.2E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	2.0E 01 4.3E 01	1.4E 00 3.3E-01	1.9E 02 4.4E 01	5.5E 00 2.5E 00	3.7E 01 KG 1.7E 01 LB
ARSENIC TRISULFIDE	1.4E 04 3.1E 04	2.4E 01 5.4E 01	2.4E 02 5.3E 02	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E 02 7.2E 01	4.0E 00 2.0E 00	3.1E 01 KG 1.4E 01 LB
BENZENE	5.8E 04 1.3E 05	2.7E 03 5.9E 03	1.0E 03 2.2E 03	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	3.7E-01 1.7E-01	2.1E-01 9.6E-02	7.2E-02 LTR 2.7E-01 GAL
BENZOIC ACID	5.4E 05 1.1E 06	1.5E 04 3.2E 04	6.7E 03 1.9E 04	1.5E 04 LTR 4.0E 03 GAL	9.5E 00 4.3E 00	1.3E 01 5.8E 00	9.1E-01 4.1E-01	1.9E-01 8.8E-02	9.6E-02 4.4E-02	3.6E-02 LTR 1.4E-01 GAL
BENZONITRILE	2.2E 05 4.8E 05	2.7E 03 5.9E 03	3.8E 03 8.3E 03	2.3E 03 KG 5.0E 03 LB	1.1E 01 4.9E 00	1.4E 01 6.4E 00	1.0E 00 4.6E-01	8.4E-01 3.8E-01	2.2E-01 1.0E-01	1.6E-01 KG 7.3E-02 LB
BENZOYL CHLORIDE	2.4E 04 5.7E 04	1.5E 04 3.2E 04	6.6E 04 1.4E 05	1.5E 04 LTR 4.0E 03 GAL	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E-01 7.7E-02	1.0E-02 8.4E-03	3.8E-02 LTR 1.1E-01 GAL
BENZYL CHLORIDE	2.3E 04 5.2E 04	1.5E 04 3.2E 04	6.1E 04 9.9E 04	1.5E 04 LTR 4.2E 03 GAL	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.2E-01 1.0E-01	2.6E-02 1.2E-02	8.3E-02 LTR 1.6E-01 GAL
BERYLLIUM CHLORIDE	3.7E 05 8.1E 05	1.5E 04 3.2E 04	6.5E 03 1.4E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	3.1E-01 1.4E-01	1.6E-01 7.3E-02	5.9E-02 KG 2.7E-02 LB
BERYLLIUM FLUORIDE	2.2E 05 4.8E 05	2.7E 03 5.9E 03	3.8E 03 8.3E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	1.7E 00 7.7E-01	2.7E-01 1.2E-01	3.2E-01 KG 1.5E-01 LB
BERYLLIUM HYDROXIDE	1.4E 05 3.5E 05	2.7E 03 5.9E 03	2.8E 03 6.1E 03	2.3E 03 KG 5.0E 03 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.7E 00 7.7E-01	3.9E-01 1.8E-01	3.2E-01 KG 1.5E-01 LB
BERYLLIUM NITRATE	1.2E 04 2.5E 04	1.5E 04 3.2E 04	2.9E 04 4.4E 04	1.5E 04 KG 3.2E 04 LB	1.5E 01 6.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	3.1E-01 1.4E-01	5.2E-02 2.3E-02	5.9E-02 KG 2.7E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
BERYLLIUM SULFATE	6.5E 03 1.4E 04	1.5E 04 3.3E 04	1.1E 04 2.5E 04	1.7E 04 KG 3.7E 04 LB	1.1E 01 2.5E 01	1.5E 01 3.4E 01	1.1E 00 2.5E 00	3.1E-01 7.0E-01	9.1E-02 2.0E-01	9.9E-02 KG 2.2E-02 LB
ARSINE	4.7E 03 1.0E 04	2.0E 01 4.4E 01	8.3E 01 1.8E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	2.2E 01 4.8E 01	1.4E 00 3.2E-01	1.9E 02 4.2E 01	1.3E 01 2.9E 02	1.7E 01 KG 3.7E 01 LB
BUTYL ACETATE	8.9E 04 2.0E 05	2.7E 03 6.0E 03	1.0E 03 2.3E 03	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 2.5E 01	1.5E 01 3.4E 01	1.1E 00 2.5E-01	6.5E-01 1.4E 00	4.2E-01 9.3E-01	1.3E-01 LTR 4.8E-01 GAL
BUTYL AMINE	5.5E 04 1.2E 05	2.7E 03 6.0E 03	9.7E 02 2.1E 03	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 2.9E 01	1.8E 01 4.1E 01	1.3E 00 2.9E-01	5.4E-01 1.2E 00	3.2E-01 7.1E-01	1.1E-01 LTR 4.1E-01 GAL
BUTYRIC ACID	5.5E 03 1.2E 04	2.7E 02 6.0E 02	9.7E 01 2.1E 02	2.1E 02 LTR 5.5E 01 GAL	1.3E 01 2.9E 01	1.8E 01 4.1E 01	1.3E 00 2.9E-01	6.5E-01 1.4E 00	4.2E-02 9.3E-02	1.4E 00 LTR 4.8E 00 GAL
CADMIUM ACETATE	6.7E 04 1.4E 05	2.0E 01 4.4E 01	8.3E 02 1.8E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	2.0E 01 4.4E 01	1.4E 00 3.2E-01	1.5E 02 3.4E 02	1.0E 02 2.2E-01	3.1E 01 KG 1.4E 01 LB
CADMIUM BROMIDE	5.5E 04 1.2E 05	2.0E 01 4.4E 01	9.7E 02 2.1E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	2.0E 01 4.4E 01	1.4E 00 3.2E-01	1.5E 02 3.4E 02	1.0E 00 2.2E-01	3.1E 01 KG 1.4E 01 LB
CADMIUM CHLORIDE	3.6E 04 7.9E 04	2.0E 01 4.4E 01	6.3E 02 1.4E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	2.0E 01 4.4E 01	1.4E 00 3.2E-01	1.5E 02 3.4E 02	2.0E 00 4.4E 00	3.1E 01 KG 1.4E 01 LB
CADMIUM NITRATE	5.0E 04 1.1E 05	2.0E 01 4.4E 01	8.7E 02 1.9E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	2.0E 01 4.4E 01	1.4E 00 3.2E-01	1.5E 02 3.4E 02	1.0E 00 2.2E-01	3.1E 01 KG 1.4E 01 LB
CADMIUM SULFATE	4.2E 04 9.2E 04	2.0E 01 4.4E 01	7.3E 02 1.6E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.4E 01	2.0E 01 4.4E 01	1.4E 00 3.2E-01	1.5E 02 3.4E 02	2.2E 00 4.8E 00	3.1E 01 KG 1.4E 01 LB
CALCIUM ARSENATE	3.1E 04 6.7E 04	2.0E 01 4.4E 01	5.3E 02 1.2E 03	2.3E 01 KG 5.0E 01 LB	1.2E 01 2.5E 01	1.6E 01 3.5E 01	1.2E 00 2.5E-01	1.5E 02 3.4E 02	2.0E 00 4.4E 00	3.1E 01 KG 1.4E 01 LB
CALCIUM ARSENITE	9.4E 04 2.1E 05	2.0E 01 4.4E 01	1.7E 03 3.8E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.8E 01	1.7E 01 3.8E 01	1.2E 00 2.7E-01	1.5E 02 3.4E 02	5.1E-01 2.3E-01	3.1E 01 KG 1.4E 01 LB
CALCIUM CARBIDE	3.0E 03 6.6E 03	1.5E 04 3.2E 04	6.7E 03 1.5E 04	1.5E 04 KG 3.2E 04 LB	9.6E 00 2.1E 01	1.3E 01 2.7E 01	9.0E-01 2.1E-01	1.9E-01 4.2E-01	1.0E-01 2.1E-02	3.0E-02 KG 1.0E-02 LB
CALCIUM CHROMATE	1.3E 04 2.9E 04	1.5E 04 3.2E 04	2.3E 04 5.1E 04	1.5E 04 KG 3.2E 04 LB	9.0E 00 2.1E 01	1.2E 01 2.5E 01	8.6E-01 2.0E-01	3.1E-01 1.4E-01	3.0E-02 1.4E-02	5.9E-02 KG 2.7E-02 LB
CALCIUM CYANIDE	5.4E 02 1.1E 03	2.0E 01 4.4E 01	8.7E 00 1.9E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.9E 01	1.7E 01 3.7E 01	1.2E 00 2.6E-01	1.1E 02 2.5E 02	9.6E 01 4.4E 01	2.3E 01 KG 1.0E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CALCIUM CHROMATE ZINC SULPHATE	3.1E 04 6.7E 04	2.7E 03 5.9E 03	5.3E 02 1.2E 03	2.3E 03 KG 5.1E 03 LB	.2E 01 .7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	1.0E 00 4.7E-01	1.6E 00 7.1E-01	2.2E-01 KG 9.7E-02 LB
CALCIUM HYDROXIDE	4.4E 03 9.8E 03	1.5E 04 3.2E 04	7.8E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	.3E 00 .2E 02	1.2E 01 5.3E 00	8.9E-01 4.0E-01	1.9E-01 8.4E-02	1.1E-01 4.9E-02	3.6E-02 KG 1.6E-02 LB
CALCIUM HYPO-CHLORITE	6.9E 03 1.5E 04	2.7E 02 5.9E 02	1.2E 02 2.7E 02	2.3E 02 KG 5.2E 02 LB	.1E 01 .8E 02	1.4E 01 6.4E 00	1.2E 00 4.9E-01	1.0E 01 4.7E 00	5.5E 00 2.5E 00	2.0E 00 KG 9.2E-01 LB
CALCIUM OXIDE	3.4E 03 7.4E 03	1.5E 04 3.2E 04	5.9E 03 1.3E 04	1.5E 04 KG 3.2E 04 LB	.8E 02 .5E 02	1.3E 01 5.9E 00	9.3E-01 4.2E-01	1.9E-01 8.8E-02	1.1E-01 5.2E-02	3.6E-02 KG 1.6E-02 LB
CAPTAN (DUNE)	8.3E 02 2.7E 03	2.4E 01 5.4E 01	1.0E 01 2.4E 01	2.3E 01 KG 5.0E 01 LB	.1E 01 .1E 00	1.9E 01 8.8E 00	1.1E 00 4.8E-01	1.1E 02 5.1E 01	6.9E 01 3.2E 01	2.3E 01 KG 1.0E 01 LB
CAPTAN (WETTABLE)	8.9E 02 2.0E 03	2.4E 01 5.4E 01	1.0E 01 2.4E 01	2.3E 01 KG 5.0E 01 LB	.5E 01 .9E 02	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.1E 02 5.1E 01	5.4E 01 2.5E 01	2.3E 01 KG 1.0E 01 LB
CARBON DISULFIDE	3.7E 03 8.5E 03	2.7E 03 6.0E 03	6.6E 03 1.4E 04	2.1E 03 LTR 5.5E 02 GAL	.1E 01 .1E 00	1.3E 01 6.0E 00	1.1E 00 4.8E-01	7.5E-01 3.4E-01	1.7E-01 7.6E-02	1.4E-01 LTR 5.4E-01 GAL
CATECHOL	3.4E 04 8.4E 04	2.7E 03 5.9E 03	6.8E 02 1.5E 03	2.1E 03 LTR 5.5E 02 GAL	.3E 01 .4E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	1.0E 00 4.7E-01	1.2E 00 5.6E-01	2.0E-01 LTR 7.5E-01 GAL
CHLORINE	2.8E 03 6.1E 03	2.4E 01 5.4E 01	6.9E 01 1.1E 02	2.3E 01 KG 5.0E 01 LB	.8E 01 .7E 00	1.4E 01 6.3E 00	9.8E-01 4.5E-01	1.1E 02 5.1E 01	1.4E 01 6.1E 00	2.3E 01 KG 1.0E 01 LB
CHLORDANE (DUNE)	8.2E 01 9.2E 01	2.4E 01 5.4E 01	7.3E-01 1.6E 00	1.9E 01 LTR 5.0E 00 GAL	1.0E 01 .7E 00	1.4E 01 6.2E 00	9.7E-01 4.4E-01	5.4E 02 1.5E 02	2.3E 03 1.1E 03	6.0E 01 LTR 2.6E 02 GAL
CHLORDANE (WETTABLE)	8.2E 01 9.2E 01	2.4E 01 5.4E 01	7.3E-01 1.6E 00	2.3E 01 KG 5.0E 01 LB	.2E 01 .3E 00	1.5E 01 7.2E 00	1.1E 00 5.2E-01	5.7E 02 1.7E 02	1.8E 03 8.2E 02	7.0E 01 KG 3.3E 01 LB
CHLOROBENZENE	5.5E 04 1.2E 05	2.7E 02 5.9E 02	9.7E 02 2.1E 03	2.1E 02 LTR 5.5E 01 GAL	.3E 01 .9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.0E 01 6.0E 00	1.5E 00 6.6E-01	2.7E 00 LTR 1.0E 01 GAL
CHLOROFORM	3.5E 03 7.6E 03	2.7E 02 5.9E 02	6.1E 03 1.3E 04	2.1E 02 LTR 5.5E 01 GAL	.2E 01 .7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	1.4E 01 6.4E 00	2.3E-01 1.1E-01	2.7E 00 LTR 1.0E 01 GAL
CHLOROSULFONIC ACID	9.6E 05 2.1E 06	2.5E 04 5.2E 04	1.7E 04 3.7E 04	1.5E 04 LTR 4.0E 03 GAL	9.2E 00 2.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	1.9E-01 8.6E-02	5.2E-02 2.3E-02	3.4E-02 LTR 1.4E-01 GAL
CHROMIC ACETATE	5.4E 04 1.1E 05	2.7E 03 5.9E 03	8.7E 02 1.9E 03	2.3E 03 KG 5.0E 03 LB	.4E 01 .5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.7E 00 7.7E-01	9.0E-01 4.0E-01	3.2E-01 KG 1.5E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CHROMIC ACID	2.9E 05 6.3E 05	2.7E 03 5.9E 03	4.9E 03 1.1E 04	2.1E 03 LTN 5.5E 02 GAL	1.3E 11 5.9E 10	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.7E 00 7.7E-01	1.0E-01 6.3E-02	3.2E-01 LTN 1.2E 00 GAL
CHROMIC SULFATE	7.5E 04 1.7E 05	2.7E 03 5.9E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.2E 03 LB	1.4E 11 6.5E 10	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.7E 00 7.7E-01	2.4E-01 2.9E-01	3.2E-01 KG 1.5E-01 LB
CHROMOUS CARBONATE	2.5E 04 5.5E 04	2.7E 03 5.9E 03	4.4E 02 9.6E 02	2.3E 03 KG 5.2E 03 LB	1.4E 11 6.3E 10	1.9E 01 8.4E 00	1.3E 00 6.0E-01	1.7E 00 7.7E-01	2.5E 04 1.1E 04	3.2E-01 KG 1.5E-01 LB
CHROMOUS CHLORIDE	2.9E 04 6.5E 04	2.7E 02 5.9E 02	4.4E 02 9.6E 02	2.3E 02 KG 5.2E 02 LB	1.5E 11 6.9E 10	2.0E 01 9.2E 00	1.4E 00 6.6E-01	1.7E 01 7.7E 00	1.9E 04 8.7E-01	3.2E 00 KG 1.5E 00 LB
CHROMOUS OXALATE	1.3E 04 2.9E 04	2.7E 03 5.9E 03	9.8E 02 1.3E 03	2.3E 03 KG 5.2E 03 LB	1.5E 11 6.7E 10	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.7E 00 7.7E-01	1.4E 04 6.5E-01	3.2E-01 KG 1.5E-01 LB
CHROMYL CHLORIDE	4.3E 05 9.5E 05	1.5E 04 3.2E 04	7.5E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	1.8E 11 8.0E 10	2.4E 01 1.1E 01	1.7E 00 7.4E-01	3.1E-01 1.4E-01	1.1E-01 5.1E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS ACETATE	2.3E 04 5.1E 04	1.5E 04 3.2E 04	4.1E 04 9.0E 04	1.5E 04 KG 3.2E 04 LB	8.8E 10 4.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	2.9E-02 1.2E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS BROMIDE	2.1E 04 4.5E 04	1.5E 04 3.2E 04	3.9E 04 7.9E 04	1.5E 04 KG 3.2E 04 LB	8.8E 10 4.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	2.9E-02 1.3E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS CHLORIDE	2.2E 04 4.9E 04	1.5E 04 3.2E 04	3.9E 04 8.6E 04	1.5E 04 KG 3.2E 04 LB	8.8E 10 4.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	2.7E-02 1.2E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS NITRATE	1.9E 04 4.1E 04	1.5E 04 3.2E 04	3.2E 04 7.1E 04	1.5E 04 KG 3.2E 04 LB	8.8E 10 4.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	3.2E-02 1.5E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS FLUORIDE	1.2E 04 2.6E 04	1.5E 04 3.2E 04	2.2E 04 4.8E 04	1.5E 04 KG 3.2E 04 LB	9.2E 10 4.2E 10	1.2E 01 5.6E 00	8.7E-01 4.0E-01	3.1E-01 1.4E-01	4.8E-02 2.2E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS FORMATE	1.7E 04 3.8E 04	1.5E 04 3.2E 04	3.8E 04 8.4E 04	1.5E 04 KG 3.2E 04 LB	8.8E 10 4.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	3.5E-02 1.6E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS IODIDE	2.9E 04 6.4E 04	8.8E-01 1.9E 00	5.1E 04 1.1E 05	8.8E-01 KG 1.9E 00 LB	8.8E 10 4.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	2.8E-02 9.2E-03	5.8E-01 KG 1.3E 00 LB
COBALTOUS NITRATE	2.7E 04 6.0E 04	1.5E 04 3.2E 04	4.8E 04 1.0E 05	1.5E 04 KG 3.2E 04 LB	8.8E 10 4.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	2.2E-02 9.9E-03	5.9E-02 KG 2.7E-02 LB
COBALTOUS PERCHLORATE	3.4E 04 7.6E 04	8.8E-01 1.9E 00	6.8E 04 1.5E 05	8.8E-01 KG 1.9E 00 LB	8.8E 10 4.0E 10	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.8E-01 1.9E 00	1.7E-02 7.8E-03	8.8E-01 KG 1.9E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
COBALTOUS SUCCINATE	1.1E 06 2.4E 06	1.5E 04 3.2E 04	1.9E 04 4.3E 04	1.5E 04 KG 3.2E 04 LB	6.6E 00 6.8E 00	1.2E 01 5.3E 00	6.4E-01 3.8E-01	3.1E-01 1.4E-01	5.0E-02 2.5E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS SULFAMATE	2.2E 06 4.9E 06	1.5E 04 3.2E 04	3.9E 04 8.6E 04	1.5E 04 KG 3.2E 04 LB	6.6E 00 6.8E 00	1.2E 01 5.3E 00	6.4E-01 3.8E-01	3.1E-01 1.4E-01	2.7E-02 1.2E-02	5.9E-02 KG 2.7E-02 LB
COBALTOUS SULFATE	2.7E 06 5.9E 06	1.5E 04 3.2E 04	4.7E 04 1.9E 05	1.5E 04 KG 3.2E 04 LB	6.6E 00 6.8E 00	1.2E 01 5.3E 00	6.4E-01 3.8E-01	3.1E-01 1.4E-01	2.2E-02 1.0E-02	5.9E-02 KG 2.7E-02 LB
COUMAPHOS (PURE)	3.1E 02 6.7E 02	2.4E 01 5.4E 01	5.3E 00 1.2E 01	2.3E 01 KG 5.2E 01 LB	1.3E 01 5.0E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.9E 02 8.4E 01	2.9E 02 9.2E 01	3.7E 01 KG 1.7E 01 LB
COUMAPHOS (WETTABLE)	3.1E 02 6.7E 02	2.4E 01 5.4E 01	5.3E 00 1.2E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.5E 00	2.0E 01 9.2E 00	1.5E 00 6.6E-01	1.9E 02 8.4E 01	1.6E 02 7.1E 01	3.7E 01 KG 1.7E 01 LB
CRESOL	1.5E 05 3.4E 05	2.7E 02 5.9E 02	2.7E 03 5.9E 03	2.1E 02 LTR 5.5E 01 GAL	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	8.4E 00 3.8E 00	3.1E-01 1.4E-01	1.6E 00 LTR 6.1E 00 GAL
CUPRIC ACETATE	1.6E 04 3.6E 04	2.7E 02 5.9E 02	2.9E 02 6.3E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.4E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.7E 01 7.7E 00	3.6E 00 1.6E 00	3.2E 00 KG 1.5E 00 LB
CUPRIC ACETOARSENITE	2.1E 04 4.7E 04	2.4E 01 5.4E 01	3.7E 02 8.2E 02	2.3E 01 KG 5.3E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.5E 02 7.2E 01	2.9E 00 1.3E 00	3.1E 01 KG 1.4E 01 LB
CUPRIC ACETYL-ACETONATE	2.2E 04 4.9E 04	2.7E 02 5.9E 02	3.6E 02 8.3E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	1.7E 01 7.7E 00	2.9E 00 1.3E 00	3.2E 00 KG 1.5E 00 LB
CUPRIC BROMIDE	1.8E 04 4.0E 04	2.7E 02 5.9E 02	3.2E 02 7.1E 02	2.3E 02 KG 5.2E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.7E 01 7.7E 00	3.2E 00 1.5E 00	3.2E 00 KG 1.5E 00 LB
CUPRIC CHLORIDE	1.4E 04 3.1E 04	2.7E 02 5.9E 02	2.4E 02 5.3E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.2E 00	2.1E 01 9.4E 00	1.5E 00 6.8E-01	1.7E 01 7.7E 00	4.3E 00 1.9E 00	3.2E 00 KG 1.5E 00 LB
CUPRIC FORMATE	1.4E 04 3.1E 04	2.7E 02 5.9E 02	2.4E 02 5.3E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.7E 01 7.7E 00	4.3E 00 1.9E 00	3.2E 00 KG 1.5E 00 LB
COPPER GLUCONATE	3.9E 04 8.6E 04	2.7E 03 5.9E 03	6.8E 02 1.5E 03	2.3E 03 KG 5.0E 03 LB	1.7E 01 7.6E 00	2.2E 01 1.0E 01	1.6E 00 7.3E-01	1.7E 00 7.7E-01	1.5E 00 7.0E-01	3.2E-01 KG 1.5E-01 LB
CUPRIC GLYCINATE	1.9E 04 4.3E 04	2.7E 02 5.9E 02	3.4E 02 7.5E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.7E 01 7.7E 00	3.1E 00 1.4E 00	3.2E 00 KG 1.5E 00 LB
CUPRIC LACTATE	1.9E 04 4.3E 04	2.7E 02 5.9E 02	3.4E 02 7.5E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.8E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.7E 01 7.7E 00	3.1E 00 1.4E 00	3.2E 00 KG 1.5E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CUPRIC NITRATE	1.9E 04 4.3E 04	2.7E 02 5.9E 02	3.4E 02 7.5E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.4E 01	2.1E 01 4.6E 01	1.5E 00 6.7E-01	1.7E 01 3.7E 01	5.1E 00 1.1E 01	5.2E 01 KG 1.5E 01 LB
CUPRIC OXALATE	1.3E 04 2.9E 04	2.7E 02 5.9E 02	2.3E 02 5.1E 02	2.3E 02 KG 5.2E 02 LB	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.7E 01 7.7E 00	4.6E 00 2.1E 00	5.2E 01 KG 1.5E 01 LB
CUPRIC SUBACETATE	1.5E 04 3.4E 04	2.7E 02 5.9E 02	2.7E 02 5.9E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.7E 01 7.7E 00	5.9E 00 1.8E 00	5.2E 01 KG 1.5E 01 LB
CUPRIC SULFATE	2.1E 04 4.5E 04	2.7E 02 5.9E 02	3.6E 02 7.9E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.7E 01 7.7E 00	2.9E 00 1.3E 00	5.2E 01 KG 1.5E 01 LB
CUPRIC SULFATE AMMONIATED	2.2E 04 4.9E 04	2.7E 02 5.9E 02	3.5E 02 7.8E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.7E 01 7.7E 00	2.9E 00 1.3E 00	5.2E 00 KG 1.5E 00 LB
CUPRIC TARTRATE	2.2E 04 4.8E 04	2.7E 02 5.9E 02	3.8E 02 8.4E 02	2.3E 02 KG 5.0E 02 LB	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.7E 01 7.7E 00	2.8E 00 1.3E 00	5.2E 00 KG 1.5E 00 LB
CUPROUS BROMIDE	1.2E 04 2.6E 04	2.7E 02 5.9E 02	2.1E 02 4.6E 02	2.3E 02 KG 5.0E 02 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.7E 01 7.7E 00	5.2E 00 2.4E 00	5.2E 00 KG 1.5E 00 LB
CUPROUS IODIDE	1.6E 04 3.4E 04	2.7E 02 5.9E 02	2.7E 02 6.0E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 6.9E 00	1.3E 01 5.8E 00	9.5E-01 4.3E-01	1.7E 01 7.7E 00	4.0E 00 1.8E 00	5.2E 00 KG 1.5E 00 LB
CYANOGEN CHLORIDE	2.2E 02 4.9E 02	2.4E 01 5.4E 01	3.9E 02 8.6E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.8E 00	1.2E 00 5.6E-01	1.5E 02 7.0E 01	2.1E 02 9.4E 01	5.1E 01 KG 1.4E 01 LB
CYCLOHEXANE	8.6E 04 1.9E 05	2.7E 03 5.9E 03	1.5E 03 3.3E 03	2.1E 03 LTK 5.5E 02 GAL	9.1E 00 4.1E 00	1.2E 01 5.5E 00	8.7E-01 3.9E-01	3.7E-01 1.7E-01	1.4E-01 6.5E-02	7.2E-02 LTK 2.7E-01 GAL
2,4-D ACID (PURE)	1.7E 04 3.7E 04	2.7E 02 5.9E 02	2.9E 02 6.4E 02	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.3E 00	1.5E 01 7.2E 00	1.1E 00 5.0E-01	1.0E 01 4.7E 02	3.7E 00 1.7E 00	2.9E 02 KG 9.8E-01 LB
2,4-D ACID (AMINE)	1.7E 04 3.7E 04	2.7E 02 5.9E 02	2.9E 02 6.4E 02	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.0E 01 4.7E 02	2.9E 02 1.3E 00	2.8E 00 KG 9.0E-01 LB
2,4-D ESTERS (PURE)	2.2E 04 4.9E 04	2.7E 02 5.9E 02	3.9E 02 8.6E 02	2.3E 02 KG 5.0E 02 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	1.0E 01 4.7E 02	2.8E 00 1.3E 00	2.8E 00 KG 9.0E-01 LB
2,4-D ESTERS (AMINE)	2.2E 04 4.9E 04	2.7E 02 5.9E 02	3.9E 02 8.6E 02	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.0E 01 4.7E 00	2.2E 00 9.8E-01	2.8E 00 KG 9.0E-01 LB
DALAPON	2.4E 03 6.1E 03	2.7E 02 5.9E 02	4.9E 01 1.1E 02	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	1.7E 01 7.7E 00	1.7E 01 7.9E 00	5.2E 00 KG 1.5E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
DDT (PURE)	8.5E 01 1.8E 02	2.4E 01 5.3E 01	1.5E 00 3.2E 00	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.2E 00	1.2E 01 5.3E 00	8.4E-01 5.0E-01	3.4E 02 1.5E 02	5.1E 02 2.3E 02	8.0E 01 KG 3.1E 01 LB
DDT (WETTABLE)	8.3E 01 1.8E 02	2.4E 01 5.3E 01	1.5E 00 3.2E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.4E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	3.7E 02 1.7E 02	7.3E 02 3.2E 02	7.4E 01 KG 3.3E 01 LB
DIAZINON (PURE)	6.1E 01 1.3E 02	2.4E 01 5.3E 01	1.1E 00 2.4E 00	2.3E 01 KG 5.0E 01 LB	1.3E 01 6.0E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.1E 02 5.1E 01	1.7E 03 8.0E 02	2.3E 01 KG 1.0E 01 LB
DIAZINON (WETTABLE)	6.1E 01 1.3E 02	2.4E 01 5.3E 01	1.1E 00 2.4E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.4E 00	2.4E 01 1.1E 01	1.7E 00 7.6F-01	1.1E 02 5.1E 01	7.9E 02 3.6E 02	2.3E 01 KG 1.0E 01 LB
DICAMBA	1.1E 05 2.4E 05	2.7E 03 5.9E 03	1.9E 03 4.3E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.0E 00	1.8E 01 8.2E 00	1.3E 00 5.7E-01	1.7E 00 7.7E-01	5.7E-01 2.6E-01	3.2E-01 KG 1.5E-01 LB
DICHLOBENIL (PURE)	4.1E 04 9.2E 04	2.7E 02 5.9E 02	7.1E 02 1.6E 03	2.3E 02 KG 5.0E 02 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	1.7E 01 7.7E 00	2.0E 00 9.2E-01	3.2E 00 KG 1.5E 00 LB
DICHLOBENIL (WETTABLE)	4.1E 04 9.2E 04	2.7E 02 5.9E 02	7.1E 02 1.6E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.7E 01 7.7E 00	1.5E 00 7.0E-01	3.2E 00 KG 1.5E 00 LB
DICHLONE (PURE)	1.1E 02 2.4E 02	2.4E 01 5.3E 01	1.9E 00 4.3E 00	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.1E-01	1.9E 02 8.4E 01	7.3E 02 3.3E 02	3.7E 01 KG 1.7E 01 LB
DICHLONE (WETTABLE)	1.1E 02 2.4E 02	2.4E 01 5.3E 01	1.9E 00 4.3E 00	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.3E-01	1.9E 02 8.4E 01	5.7E 02 2.6E 02	5.7E 01 KG 1.7E 01 LB
4 DICHLOROPS	1.1E 03 2.4E 03	2.4E 01 5.3E 01	1.9E 01 4.2E 01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.0E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.9E 02 8.4E 01	5.8E 01 2.6E 01	3.7E 01 KG 1.7E 01 LB
DIELDRIN (PURE)	1.4E 02 3.1E 02	2.4E 01 5.3E 01	2.4E 00 5.3E 00	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	3.4E 02 1.5E 02	6.9E 02 3.2E 02	6.4E 01 KG 3.1E 01 LB
DIELDRIN (WETTABLE)	1.4E 02 3.1E 02	2.4E 01 5.3E 01	2.4E 00 5.3E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 8.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	3.7E 02 1.7E 02	5.4E 02 2.5E 02	7.4E 01 KG 3.3E 01 LB
DIETHYLAMINE	2.4E 05 5.2E 05	2.7E 03 5.9E 03	4.1E 03 9.1E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	5.6E-01 2.6E-01	1.6E-01 7.2E-02	1.1E-01 KG 4.9E-02 LB
DIMETHYLAMINE	2.0E 05 4.4E 05	2.7E 03 5.9E 03	4.9E 03 1.1E 04	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	5.6E-01 2.6E-01	1.4E-01 6.1E-02	1.1E-01 KG 4.9E-02 LB
DINITROPHENOL	9.7E 04 2.1E 05	2.7E 02 5.9E 02	1.7E 03 3.7E 03	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	1.8E 01 8.7E 00	4.9E-01 2.2E-01	2.3E 00 KG 9.9E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	INCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	INCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
DIQUAT	2.0E 04 6.1E 04	2.7E 02 5.9E 02	4.9E 02 1.1E 03	2.3E 02 KG 5.0E 02 LB	.5E 01 .4E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.7E 01 7.7E 00	1.7E 04 7.9E-01	3.2E 00 KG 1.5E 00 LB
DISULFOTON (PURE)	1.0E 02 1.9E 02	2.0E 01 5.0E 01	3.1E 00 6.8E 00	2.3E 01 KG 5.0E 01 LB	.5E 01 .9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.9E 02 8.4E 01	3.5E 02 1.6E 02	7.7E 01 KG 1.7E 01 LB
DISULFOTON (WETTABLE)	1.0E 02 5.9E 02	2.0E 01 5.0E 01	3.1E 00 6.8E 00	2.3E 01 KG 5.0E 01 LB	.6E 01 .4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.9E 02 8.4E 01	2.7E 02 1.2E 02	3.7E 01 KG 1.7E 01 LB
DIURON (PURE)	5.0E 03 1.1E 04	2.7E 02 5.9E 02	8.7E 01 1.9E 02	2.3E 02 KG 5.0E 02 LB	.4E 01 .2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.7E 01 7.7E 00	1.6E 01 7.4E 00	3.2E 00 KG 1.5E 00 LB
DIURON (WETTABLE)	5.0E 03 1.1E 04	2.7E 02 5.9E 02	8.7E 01 1.9E 02	2.3E 02 KG 5.0E 02 LB	.6E 01 .2E 00	2.1E 01 9.6E 00	1.5E 00 6.9E-01	1.7E 01 7.7E 00	1.3E 01 5.7E 00	3.2E 00 KG 1.5E 00 LB
DODECYLBENZENE SULFONIC ACID	2.5E 04 5.5E 04	2.7E 02 5.9E 02	4.4E 02 9.6E 02	2.3E 02 KG 5.0E 02 LB	.3E 01 .8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.0E 01 4.7E 00	1.9E 00 8.7E-01	2.0E 00 KG 9.0E-01 LB
DURSBAN (PURE)	1.1E 02 2.4E 02	2.0E 01 5.0E 01	1.9E 00 4.3E 00	2.3E 01 KG 5.0E 01 LB	.4E 01 .5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.9E 02 8.4E 01	5.6E 02 2.5E 02	3.7E 01 KG 1.7E 01 LB
DURSBAN (WETTABLE)	1.1E 02 2.4E 02	2.0E 01 5.0E 01	1.9E 00 4.3E 00	2.3E 01 KG 5.0E 01 LB	.6E 01 .4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.9E 02 8.4E 01	4.3E 02 2.0E 02	3.7E 01 KG 1.7E 01 LB
ENDOSULFAN (PURE)	2.0E 01 6.1E 01	2.0E 01 5.0E 01	4.9E-01 1.1E 00	2.3E 01 KG 5.0E 01 LB	.5E 01 .7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	1.9E 02 8.4E 01	2.2E 03 1.0E 03	3.7E 01 KG 1.7E 01 LB
ENDOSULFAN (WETTABLE	2.0E 01 6.1E 01	2.0E 01 5.0E 01	4.9E-01 1.1E 00	2.3E 01 KG 5.0E 01 LB	.6E 01 .5E 00	2.2E 01 1.0E 01	1.6E 00 7.1E-01	1.9E 02 8.4E 01	1.7E 03 7.9E 02	3.7E 01 KG 1.7E 01 LB
ENDRIN (PURE)	8.0E 00 1.9E 01	2.0E 01 5.0E 01	1.5E-01 3.3E-01	2.3E 01 KG 5.0E 01 LB	.3E 01 .9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	3.4E 02 1.5E 02	1.1E 04 5.1E 03	6.8E 01 KG 3.1E 01 LB
ENDRIN (WETTABLE)	8.0E 00 1.9E 01	2.0E 01 5.0E 01	1.5E-01 3.3E-01	2.3E 01 KG 5.0E 01 LB	.4E 01 .2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	3.7E 02 1.7E 02	8.7E 03 4.0E 03	7.4E 01 KG 3.3E 01 LB
ETHION (PURE)	3.4E 02 7.9E 02	2.0E 01 5.0E 01	6.3E 00 1.4E 01	2.3E 01 KG 5.0E 01 LB	.3E 01 .6E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.9E 02 8.4E 01	1.7E 02 7.8E 01	3.7E 01 KG 1.7E 01 LB
ETHION (WETTABLE)	3.4E 02 7.9E 02	2.0E 01 5.0E 01	6.3E 00 1.4E 01	2.3E 01 KG 5.0E 01 LB	.6E 01 .3E 00	2.1E 01 9.7E 00	1.5E 00 6.9E-01	1.9E 02 8.4E 01	1.3E 02 6.0E 01	3.7E 01 KG 1.7E 01 LB
ETHYLBENZENE	8.0E 04 1.8E 05	2.7E 03 5.9E 03	1.4E 03 3.1E 03	2.1E 03 LTR 5.5E 02 GAL	.8E 00 .8E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	7.5E-01 3.4E-01	3.4E-01 1.5E-01	1.4E-01 LTR 5.4E-01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ETHYLENEDIAMINE	3.9E 04 8.6E 04	2.7E 03 5.9E 03	4.8E 02 1.9E 03	2.1E 03 LTR 5.5E 02 GAL	1.4E 01 3.3E 00	1.0E 01 8.3E 00	1.3E 00 6.0E-01	8.4E-01 5.8E-01	1.2E 00 5.3E-01	1.0E-01 LTR 8.1E-01 GAL
EDTA	1.4E 04 3.1E 04	1.5E 04 3.2E 04	2.4E 04 5.3E 04	1.5E 04 LTR 4.0E 03 GAL	1.0E 00 2.4E 00	1.2E 01 5.5E 00	8.4E-01 5.8E-01	3.1E-01 1.4E-01	9.8E-02 2.7E-02	7.9E-02 LTR 2.2E-01 GAL
FERRIC AMMONIUM CITRATE	1.3E 05 2.9E 05	2.7E 03 5.9E 03	2.3E 03 5.1E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.5E 00	1.0E 01 7.3E 00	1.2E 00 5.2E-01	1.7E 00 7.7E-01	4.5E-01 2.0E-01	3.2E-01 KG 1.5E-01 LB
FERRIC CHLORIDE	1.1E 05 2.4E 05	2.7E 03 5.9E 03	1.9E 03 4.2E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 00	1.0E 01 8.3E 00	1.3E 00 6.0E-01	1.7E 00 7.7E-01	2.5E-01 2.5E-01	3.2E-01 KG 1.5E-01 LB
FERRIC FLUORIDE	7.8E 04 1.7E 05	2.7E 03 5.9E 03	1.4E 03 3.0E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.2E 00	1.0E 01 8.2E 00	1.3E 00 5.9E-01	1.7E 00 7.7E-01	7.6E-01 3.5E-01	5.2E-01 KG 1.5E-01 LB
FERRIC NITRATE	1.7E 05 3.7E 05	2.7E 03 5.9E 03	2.9E 03 6.4E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.8E 00	1.0E 01 8.0E 00	1.3E 00 5.7E-01	1.7E 00 7.7E-01	3.6E-01 1.6E-01	3.2E-01 KG 1.5E-01 LB
FERRIC PHOSPHATE	7.8E 04 1.7E 05	2.7E 03 5.9E 03	1.4E 03 3.0E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 2.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.7E 00 7.7E-01	7.9E-01 3.6E-01	3.2E-01 KG 1.5E-01 LB
FERRIC SULFATE	1.1E 05 2.4E 05	2.7E 03 5.9E 03	1.9E 03 4.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.7E 00 7.7E-01	5.4E-01 2.4E-01	3.2E-01 KG 1.5E-01 LB
FERROUS AMMONIUM SULFATE	1.1E 05 2.4E 05	2.7E 03 5.9E 03	1.9E 03 4.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.3E 00	1.9E 01 8.4E 00	1.3E 00 6.0E-01	1.7E 00 7.7E-01	5.4E-01 2.4E-01	3.2E-01 KG 1.5E-01 LB
FERROUS CHLORIDE	7.8E 04 1.7E 05	2.7E 03 5.9E 03	1.4E 03 3.0E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.7E 00 7.7E-01	7.6E-01 3.5E-01	5.2E-01 KG 1.5E-01 LB
FERROUS OXALATE	7.2E 04 1.6E 05	2.7E 03 5.9E 03	1.3E 03 2.8E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 2.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.7E 00 7.7E-01	6.6E-01 3.0E-01	3.2E-01 KG 1.5E-01 LB
FERROUS SULFATE	1.1E 05 2.4E 05	2.7E 03 5.9E 03	1.9E 03 4.3E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.3E 00	1.8E 01 8.3E 00	1.3E 00 6.0E-01	1.7E 00 7.7E-01	5.4E-01 2.4E-01	3.2E-01 KG 1.5E-01 LB
FORMALDEHYDE	6.8E 05 1.5E 06	1.5E 04 3.2E 04	1.0E 04 2.3E 04	1.5E 04 LTR 4.0E 03 GAL	9.2E 00 2.0E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	1.5E-01 7.0E-02	7.7E-02 3.5E-02	3.9E-02 LTR 1.1E-01 GAL
FORMIC ACID	2.4E 05 5.2E 05	2.7E 03 5.9E 03	4.1E 03 9.1E 03	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 2.1E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	8.4E-01 3.8E-01	1.9E-01 8.8E-02	1.6E-01 LTR 6.1E-01 GAL
FUMARIC ACID	3.8E 05 8.4E 05	1.5E 04 3.2E 04	6.7E 03 1.5E 04	1.5E 04 LTR 4.0E 03 GAL	7.7E 00 1.6E 00	1.3E 01 5.9E 00	9.2E-01 4.2E-01	1.9E-01 8.6E-02	1.3E-01 5.7E-02	3.0E-02 LTR 1.4E-01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
FURFURAL	6.7E 04 1.5E 05	2.7E 03 5.9E 03	1.2E 03 2.6E 03	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 2.8E 01	1.7E 01 7.8E 01	1.2E 00 5.5E-01	8.4E-01 3.8E-01	7.2E-01 3.3E-01	1.6E-01 LTR 6.1E-01 GAL
GUTHION (PURE)	2.2E 01 4.1E 01	2.4E 01 5.4E 01	4.9E-01 1.1E 00	2.3E 01 KG 5.2E 01 LB	1.2E 01 2.6E 01	2.9E 01 9.2E 00	1.5E 00 6.6E-01	1.9E 02 8.4E 01	2.2E 03 1.0E 03	5.7E 01 KG 1.7E 01 LB
GUTHION (WETTABLE)	2.2E 01 4.1E 01	2.4E 01 5.4E 01	4.9E-01 1.1E 00	2.3E 01 KG 5.2E 01 LB	1.2E 01 2.5E 01	2.2E 01 9.8E 00	1.5E 00 7.0E-01	1.9E 02 8.4E 01	1.7E 03 7.9E 02	3.7E 01 KG 1.7E 01 LB
HEPTACHLOR (PURE)	1.9E 03 4.3E 03	2.4E 01 5.4E 01	3.4E 01 7.5E 01	2.3E 01 KG 5.2E 01 LB	8.8E 00 2.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.4E 02 1.5E 02	5.2E 01 2.3E 01	4.9E 01 KG 1.1E 01 LB
HEPTACHLOR (WETTABLE)	1.9E 03 4.3E 03	2.4E 01 5.4E 01	3.4E 01 7.5E 01	2.3E 01 KG 5.2E 01 LB	1.7E 01 7.6E 02	2.2E 01 1.0E 01	1.6E 00 7.3E-01	3.7E 02 1.7E 02	3.9E 01 1.8E 0	7.4E 01 KG 3.3E 01 LB
HYDROCHLORIC ACID	6.8E 05 1.5E 06	1.5E 04 3.2E 04	1.8E 04 2.5E 04	1.5E 04 LTR 4.0E 03 GAL	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.8E-01 4.1E-01	1.9E-01 8.6E-02	8.8E-02 3.7E-02	3.6E-02 LTR 1.4E-01 GAL
HYDROFLUORIC ACID	3.3E 05 7.3E 05	1.5E 04 3.2E 04	5.8E 03 1.3E 04	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 4.9E 00	1.4E 01 6.5E 00	1.0E 00 4.6E-01	1.5E-01 7.2E-02	1.4E-01 6.2E-02	5.8E-02 LTR 1.1E-01 GAL
HYDROGEN CYANIDE	2.2E 02 4.1E 02	2.4E 01 5.4E 01	4.9E 00 1.1E 01	2.3E 01 KG 5.2E 01 LB	1.3E 01 2.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	9.3E 01 4.2E 01	1.4E 02 6.1E 01	1.8E 01 KG 8.4E 00 LB
HYDROQUINONE	1.9E 04 3.1E 04	2.7E 02 5.9E 02	2.4E 02 5.3E 02	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.2E 01 4.7E 00	3.5E 00 1.6E 00	2.3E 00 KG 9.0E-01 LB
HYDROXYLAMINE	4.2E 05 9.2E 05	1.5E 04 3.2E 04	7.3E 03 1.6E 04	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	1.5E-01 7.0E-02	1.2E-01 5.2E-02	5.0E-02 LTR 1.1E-01 GAL
ISOPHENE	2.1E 05 4.6E 05	2.7E 03 5.9E 03	3.6E 03 8.0E 03	2.1E 03 LTR 5.5E 02 GAL	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	3.7E-01 1.7E-01	5.9E-02 2.7E-02	7.2E-02 LTR 2.7E-01 GAL
ISOPROPANOLAMINE DDB SULFONATE	3.3E 04 7.3E 04	2.7E 03 5.9E 03	5.8E 02 1.3E 03	2.3E 03 KG 5.0E 03 LB	8.2E-01 8.2E-01	3.6E-01 3.6E-01	2.6E-01 2.6E-01	1.0E 00 4.7E-01	1.4E 00 6.5E-01	2.0E-01 KG 9.2E-02 LB
KELTHANE (PURE)	2.8E 05 6.1E 05	2.7E 03 5.9E 03	4.9E 03 1.1E 04	2.3E 03 KG 5.0E 03 LB	1.1E 01 5.0E 00	1.5E 01 6.6E 00	1.2E 00 4.7E-01	4.7E-01 2.1E-01	2.9E-01 1.3E-01	9.0E-02 KG 4.1E-02 LB
KELTHANE (WETTABLE)	2.8E 05 6.1E 05	2.7E 03 5.9E 03	4.9E 03 1.1E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.8E 00	1.2E 00 5.6E-01	7.5E-01 3.4E-01	2.3E-01 1.0E-01	1.4E-01 KG 6.5E-02 LB
LEAD ACETATE	1.2E 06 2.6E 06	2.4E 01 5.4E 01	2.1E 04 4.6E 04	2.3E 01 KG 5.0E 01 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	1.5E 02 7.0E 01	7.8E-02 3.5E-02	5.1E 01 KG 1.4E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
LEAD ARSENIDE	1.2E 06 2.5E 06	2.4E 01 5.4E 01	2.3E 04 4.5E 04	2.3E 01 KG 5.0E 01 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	1.5E 02 7.0E 01	6.8E-02 3.0E-02	3.1E 01 KG 1.4E 01 LB
LEAD CHLORIDE	8.7E 05 1.9E 06	2.4E 01 5.4E 01	1.5E 04 3.4E 04	2.3E 01 KG 5.0E 01 LB	9.2E 00 4.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	1.5E 02 7.0E 01	1.1E-01 4.8E-02	4.1E 01 KG 1.9E 01 LB
LEAD FLUOBORATE	1.2E 06 2.6E 06	2.4E 01 5.4E 01	2.1E 04 4.6E 04	2.3E 01 KG 5.0E 01 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	1.5E 02 7.0E 01	7.7E-02 3.5E-02	3.1E 01 KG 1.4E 01 LB
LEAD FLUORIDE	7.7E 05 1.7E 06	2.4E 01 5.4E 01	1.4E 04 3.0E 04	2.3E 01 KG 5.0E 01 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.2E-01 4.1E-01	1.5E 02 7.0E 01	1.2E-01 5.7E-02	3.1E 01 KG 1.4E 01 LB
LEAD IODIDE	1.4E 06 3.2E 06	2.4E 01 5.4E 01	2.5E 04 5.5E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E 02 7.0E 01	6.7E-02 3.0E-02	3.1E 01 KG 1.4E 01 LB
LEAD NITRATE	1.0E 06 2.3E 06	2.4E 01 5.4E 01	1.8E 04 4.0E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E 02 7.0E 01	8.9E-02 4.1E-02	3.1E 01 KG 1.4E 01 LB
LEAD STEARATE	2.4E 06 5.4E 06	2.4E 01 5.4E 01	4.3E 04 9.4E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E 02 7.0E 01	3.6E-02 1.7E-02	3.1E 01 KG 1.4E 01 LB
LEAD SULFATE	9.5E 25 2.1E 06	2.4E 01 5.4E 01	1.7E 04 3.7E 04	2.3E 01 KG 5.0E 01 LB	8.9E 00 4.0E 00	1.2E 01 5.4E 00	8.5E-01 3.9E-01	1.5E 02 7.0E 01	1.0E-01 4.6E-02	3.1E 01 KG 1.4E 01 LB
LEAD SULFIDE	7.5E 25 1.7E 06	2.4E 01 5.4E 01	1.3E 04 2.9E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E 02 7.0E 01	1.3E-01 5.8E-02	3.1E 01 KG 1.4E 01 LB
LEAD TETRA-ACETATE	1.4E 06 3.1E 06	2.4E 01 5.4E 01	2.4E 04 5.4E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E 02 7.0E 01	6.7E-02 3.0E-02	3.1E 01 KG 1.4E 01 LB
LEAD THIOCYANATE	1.0E 06 2.2E 06	2.4E 01 5.4E 01	1.6E 04 3.9E 04	2.3E 01 KG 5.0E 01 LB	8.9E 00 4.0E 00	1.2E 01 5.4E 00	8.5E-01 3.9E-01	1.5E 02 7.0E 01	9.5E-02 4.3E-02	3.1E 01 KG 1.4E 01 LB
LEAD THIOSULFATE	1.0E 06 2.2E 06	2.4E 01 5.4E 01	1.7E 04 3.8E 04	2.3E 01 KG 5.0E 01 LB	8.9E 00 4.0E 00	1.2E 01 5.4E 00	8.5E-01 3.9E-01	1.5E 02 7.0E 01	9.6E-02 4.4E-02	3.1E 01 KG 1.4E 01 LB
LEAD TUNGSTATE	1.4E 06 3.1E 06	2.4E 01 5.4E 01	2.5E 04 5.5E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E 02 7.0E 01	6.7E-02 3.1E-02	3.1E 01 KG 1.4E 01 LB
LINDANE (PURE)	1.9E 03 2.2E 03	2.4E 01 5.4E 01	1.7E 01 3.8E 01	2.3E 01 KG 5.0E 01 LB	1.4E 01 9.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	3.4E 02 1.5E 02	8.1E 01 3.7E 01	6.8E 01 KG 3.1E 01 LB
LINDANE (WETTABLE)	1.8E 03 2.2E 03	2.4E 01 5.4E 01	1.7E 01 3.8E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.4E-01	3.7E 02 1.7E 02	8.3E 01 2.9E 01	7.4E 01 KG 3.3E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
LITHIUM HICHROMATE	5.7E 05 8.1E 05	1.5E 04 3.2E 04	6.5E 03 1.4E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	3.1E-01 1.4E-01	1.0E-01 4.7E-02	5.9E-02 KG 2.7E-02 LB
LITHIUM CHROMATE	4.9E 05 1.0E 06	1.5E 04 3.2E 04	6.1E 03 1.4E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	3.1E-01 1.4E-01	0.3E-02 3.0E-02	5.9E-02 KG 2.7E-02 LB
LITHIUM FLUORIDE	5.2E 05 1.1E 06	1.5E 04 3.2E 04	9.3E 03 2.0E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 4.9E 00	1.4E 01 6.4E 00	1.0E 00 4.6E-01	3.1E-01 1.4E-01	9.3E-02 4.2E-02	5.9E-02 KG 2.7E-02 LB
MALATHION (PURE)	9.2E 01 2.0E 02	2.4E 01 5.0E 01	1.6E 00 3.5E 00	1.9E 01 LTR 5.0E 00 GAL	1.6E 01 7.2E 00	2.1E 01 9.0E 00	1.5E 00 6.9E-01	1.9E 02 8.4E 01	6.7E 02 3.1E 02	3.7E 01 LTR 1.4E 02 GAL
MALATHION (WETTABLE)	9.2E 01 2.0E 02	2.4E 01 5.0E 01	1.6E 00 3.5E 00	1.9E 01 LTR 5.0E 00 GAL	1.7E 01 7.4E 00	2.2E 01 1.0E 01	1.6E 00 7.3E-01	1.9E 02 8.4E 01	5.2E 02 2.4E 02	3.7E 01 LTR 1.4E 02 GAL
MALEIC ACID	5.0E 05 8.4E 05	1.5E 04 3.2E 04	6.7E 03 1.5E 04	1.5E 04 KG 3.2E 04 LB	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	1.9E-01 8.6E-02	1.3E-01 5.7E-02	3.6E-02 KG 1.6E-02 LB
MALEIC ANHYDRIDE	5.2E 05 7.2E 05	1.5E 04 3.2E 04	5.7E 03 1.3E 04	1.5E 04 KG 3.2E 04 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	1.2E-01 5.5E-02	1.2E-01 5.2E-02	2.3E-02 KG 1.0E-02 LB
MERCURIC ACETATE	8.9E 02 2.0E 03	2.4E 01 5.0E 01	1.6E 01 3.4E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.3E-01	3.4E 02 1.5E 02	1.0E 02 4.6E 01	8.0E 01 KG 3.1E 01 LB
MERCURIC CHLORIDE	7.4E 02 1.7E 03	2.0E 01 5.0E 01	1.4E 01 3.2E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.6E 00	2.2E 01 1.0E 01	1.6E 00 7.3E-01	3.4E 02 1.5E 02	1.2E 02 5.4E 01	8.0E 01 KG 3.1E 01 LB
MERCURIC NITRATE	9.0E 02 2.1E 03	2.4E 01 5.0E 01	1.7E 01 3.6E 01	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.3E-01	3.4E 02 1.5E 02	9.0E 01 4.5E 01	8.0E 01 KG 3.1E 01 LB
MERCURIC OXIDE	6.1E 02 1.3E 03	2.0E 01 5.0E 01	1.1E 01 2.4E 01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	3.4E 02 1.5E 02	1.6E 02 7.2E 01	8.0E 01 KG 3.1E 01 LB
MERCURIC SULFATE	8.4E 02 1.9E 03	2.0E 01 5.0E 01	1.5E 01 3.3E 01	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.1E-01	3.4E 02 1.5E 02	1.1E 02 4.9E 01	8.0E 01 KG 3.1E 01 LB
MERCURIC THIOCYANATE	9.2E 02 2.0E 03	2.4E 01 5.0E 01	1.6E 01 3.5E 01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.3E 00	2.2E 01 9.8E 00	1.5E 00 7.0E-01	3.4E 02 1.5E 02	1.1E 02 4.8E 01	8.0E 01 KG 3.1E 01 LB
MERCUROUS NITRATE	8.0E 02 1.8E 03	2.4E 01 5.0E 01	1.4E 01 3.1E 01	2.3E 01 KG 5.0E 01 LB	4.9E 00 6.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.4E 02 1.5E 02	1.2E 02 5.2E 01	8.0E 01 KG 3.1E 01 LB
METHOXYCHLOR (PURE)	2.2E 02 4.9E 02	2.0E 01 5.0E 01	3.9E 00 8.6E 00	1.9E 01 LTR 5.0E 00 GAL	9.7E 00 0.4E 00	1.3E 01 5.9E 00	9.2E-01 4.2E-01	1.9E 02 8.4E 01	3.6E 02 1.7E 02	3.7E 01 LTR 1.4E 02 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
METHOXYCHLOR (WETTABLE)	2.2E 02 4.9E 02	4.4E 01 9.4E 01	9.9E 00 2.2E 01	1.9E 01 LTR 5.0E 00 GAL	4.4E 01 1.0E 02	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.9E 02 8.4E 01	2.0E 02 1.5E 02	3.7E 01 LTR 1.4E 02 GAL
METHYL MERCAPTAN	2.0E 03 9.1E 03	2.7E 02 5.9E 02	4.9E 01 1.1E 02	2.3E 02 KG 5.0E 02 LB	5.5E 01 1.2E 02	2.2E 01 9.2E 00	1.5E 00 6.6E-01	8.4E 00 3.8E 00	8.4E 00 2.0E 00	1.8E 02 KG 7.3E+01 LB
METHYL METHACRYLATE	4.9E 05 1.5E 06	1.5E 04 3.2E 04	1.2E 04 2.7E 04	1.5E 04 LTR 4.2E 03 GAL	2.4E 00 5.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	6.9E-02 3.1E-02	1.0E-02 8.1E-03	1.3E+02 LTR 5.0E+02 GAL
METHYL PARATHION (PURE)	8.3E 00 1.8E 01	2.4E 01 5.0E 01	1.5E-01 3.2E-01	1.9E 01 LTR 5.0E 00 GAL	4.3E 01 9.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	1.1E 02 5.1E 01	7.4E 03 3.4E 03	2.3E 01 LTR 8.8E 01 GAL
METHYL PARATHION (WETTABLE)	8.3E 00 1.8E 01	2.4E 01 5.0E 01	1.5E-01 3.2E-01	1.9E 01 LTR 5.0E 00 GAL	4.3E 01 9.1E 00	1.8E 01 8.2E 00	1.3E 00 5.8E-01	1.1E 02 5.1E 01	5.0E 03 2.0E 03	2.3E 01 LTR 8.6E 01 GAL
MEVINPHOS	1.1E 02 2.4E 02	2.4E 01 5.0E 01	1.9E 00 4.3E 00	1.9E 01 LTR 5.0E 00 GAL	4.3E 01 9.8E 00	1.7E 01 7.8E 00	1.2E 00 5.5E-01	1.1E 02 5.1E 01	4.1E 02 1.9E 02	2.3E 01 LTR 8.6E 01 GAL
MOLYBDIC TRIOXIDE	1.7E 06 3.7E 06	1.5E 04 3.2E 04	1.8E 04 4.0E 04	1.5E 04 KG 3.2E 04 LB	3.5E 00 7.5E 00	1.3E 01 9.0E 00	9.1E-01 4.1E-01	3.1E-01 1.4E-01	4.7E-02 2.1E-02	5.9E+02 KG 2.7E+02 LB
MONOETHYLAMINE	1.1E 05 2.4E 05	2.7E 02 5.9E 02	1.9E 03 4.3E 03	2.1E 02 LTR 5.5E 01 GAL	4.3E 01 9.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	5.6E 00 2.6E 00	4.1E-01 1.9E-01	1.1E 00 LTR 4.1E 00 GAL
MONOMETHYLAMINE	4.3E 04 1.0E 05	2.7E 02 5.9E 02	1.5E 03 3.2E 03	2.1E 02 LTR 5.5E 01 GAL	4.3E 01 9.4E 00	1.8E 01 8.0E 00	1.3E 00 5.7E-01	5.6E 00 2.6E 00	4.5E-01 2.0E-01	1.1E 00 LTR 4.1E 00 GAL
NALED	5.4E 02 1.1E 03	2.4E 01 5.0E 01	8.7E 00 1.9E 01	2.3E 01 KG 5.0E 01 LB	5.3E 01 1.2E 02	1.7E 01 7.6E 00	1.2E 00 5.4E-01	1.1E 02 5.1E 01	1.2E 02 5.0E 01	2.3E 01 KG 1.0E 01 LB
NAPHTHALENE	5.2E 03 1.1E 04	2.4E 01 5.0E 01	8.7E 01 1.9E 02	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.7E 02 7.7E 01	1.6E 01 7.4E 00	3.4E 01 KG 1.5E 01 LB
NAPHTHENIC ACID	2.0E 04 4.3E 04	2.4E 01 5.0E 01	3.4E 02 7.6E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	1.9E 02 8.4E 01	3.2E 00 1.5E 00	3.7E 01 KG 1.7E 01 LB
NICKEL ACETATE	1.5E 06 3.2E 06	1.5E 04 3.2E 04	2.6E 04 5.6E 04	1.5E 04 KG 3.2E 04 LB	1.0E 00 2.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	5.1E-01 1.4E-01	4.1E-02 1.8E-02	5.9E+02 KG 2.7E+02 LB
NICKEL AMMONIUM SULFATE	2.3E 06 5.1E 06	1.5E 04 3.2E 04	4.1E 04 8.9E 04	1.5E 04 KG 3.2E 04 LB	1.0E 00 2.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	2.6E-02 1.2E-02	5.9E+02 KG 2.7E+02 LB
NICKEL BROMIDE	1.8E 06 3.9E 06	1.5E 04 3.2E 04	2.8E 04 6.2E 04	1.5E 04 KG 3.2E 04 LB	1.0E 00 2.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	3.7E-02 1.7E-02	5.9E+02 KG 2.7E+02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
NICKEL CHLORIDE	1.4E 04 3.1E 04	1.5E 04 3.2E 04	2.4E 04 5.4E 04	1.5E 04 KG 3.2E 04 LB	3.6E 00 7.9E 00	1.2E 01 5.3E 00	6.4E-01 3.8E-01	3.1E-01 1.4E-01	6.2E-02 1.4E-02	5.9E-02 KG 2.7E-02 LB
NICKEL FORMATE	1.1E 04 2.4E 04	1.5E 04 3.2E 04	1.9E 04 4.2E 04	1.5E 04 KG 3.2E 04 LB	2.7E 00 5.9E 00	1.3E 01 5.9E 00	9.2E-01 4.2E-01	3.1E-01 1.4E-01	5.5E-02 2.5E-02	5.9E-02 KG 2.7E-02 LB
NICKEL HYDROXIDE	5.5E 03 1.2E 04	1.5E 04 3.2E 04	9.6E 03 2.1E 04	1.5E 04 KG 3.2E 04 LB	1.4E 00 3.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	1.1E-01 5.1E-02	5.9E-02 KG 2.7E-02 LB
NICKEL NITRATE	1.7E 04 3.8E 04	2.0E-01 2.0E-01	3.8E 04 8.4E 04	6.3E-38 2KG 1.6E 01 LB	3.8E 00 8.2E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.2E-01 8.2E-01	3.5E-02 1.6E-02	8.2E-01 2KG 3.2E-39 LB
NICKEL SULFATE	1.5E 04 3.4E 04	1.5E 04 3.2E 04	2.7E 04 6.0E 04	1.5E 04 KG 3.2E 04 LB	3.6E 00 8.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.1E-01 1.4E-01	3.8E-02 1.7E-02	5.9E-02 KG 2.7E-02 LB
NITRIC ACID	6.0E 03 1.3E 04	1.5E 04 3.2E 04	1.2E 04 2.3E 04	1.5E 04 LTN 4.0E 03 GAL	2.4E 00 5.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	1.9E-01 8.6E-02	7.7E-02 3.5E-02	3.6E-02 LTN 1.4E-01 GAL
NITROBENZENE	4.1E 03 9.2E 03	1.5E 04 3.2E 04	7.3E 03 1.6E 04	1.5E 04 LTN 4.0E 03 GAL	1.1E 01 2.4E 00	1.5E 01 6.7E 00	1.0E 00 4.6E-01	3.1E-01 1.4E-01	1.5E-01 6.9E-02	5.9E-02 LTN 2.2E-01 GAL
NITROGEN DIOXIDE	4.4E 03 9.6E 03	1.5E 04 3.2E 04	7.4E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	1.0E 00 2.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	1.9E-01 8.6E-02	1.0E-01 4.8E-02	3.6E-02 KG 1.6E-02 LB
NITROPHENOL	1.3E 03 2.8E 03	2.7E 02 5.9E 02	2.2E 03 4.9E 03	2.3E 02 KG 5.2E 02 LB	3.5E 01 7.1E 00	1.6E 01 8.1E 00	1.1E 00 5.0E-01	1.7E 01 7.7E 00	4.9E-01 2.2E-01	3.2E 00 KG 1.5E 00 LB
PARAFORMALDEHYDE	6.2E 03 1.3E 04	1.5E 04 3.2E 04	1.0E 04 2.3E 04	1.5E 04 LTN 4.0E 03 GAL	3.4E 01 7.3E 00	1.4E 01 6.3E 00	9.0E-01 4.5E-01	1.9E-01 8.6E-02	8.0E-02 3.7E-02	3.6E-02 LTN 1.4E-01 GAL
PARATHION (PURE)	1.9E 01 4.3E 01	2.4E 01 5.4E 01	3.4E-01 7.5E-01	1.9E 01 LTN 5.2E 00 GAL	1.6E 01 7.5E 00	2.2E 01 1.0E 01	1.6E 00 7.1E-01	1.9E 02 8.4E 01	4.2E 03 1.9E 03	5.7E 01 LTN 1.4E 02 GAL
PARATHION (METTAYLE)	1.9E 01 4.3E 01	2.4E 01 5.4E 01	3.4E-01 7.3E-01	1.9E 01 LTN 5.1E 00 GAL	1.8E 01 8.2E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.9E 02 8.4E 01	3.2E 03 1.5E 03	5.7E 01 LTN 1.4E 02 GAL
PENTACHLOROPHENOL	6.9E 02 1.5E 03	2.4E 01 5.4E 01	1.2E 01 2.7E 01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.1E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	1.7E 02 7.7E 01	1.2E 02 5.3E 01	3.4E 01 KG 1.5E 01 LB
PHENOL	6.5E 04 1.4E 05	2.7E 02 5.9E 02	1.1E 03 2.5E 03	2.3E 02 KG 5.0E 02 LB	1.1E 01 2.4E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	8.4E 00 3.8E 00	7.4E-01 3.3E-01	1.6E 00 KG 7.3E-01 LB
PHOSGENE	8.1E 03 1.4E 04	1.5E 04 3.2E 04	1.4E 04 3.1E 04	1.5E 04 KG 3.2E 04 LB	3.3E 00 7.2E 00	1.2E 01 5.6E 00	8.8E-01 4.0E-01	1.9E-01 8.6E-02	5.9E-02 2.7E-02	3.6E-02 KG 1.6E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PHOSPHORIC ACID	2.6E 06 5.7E 06	1.5E 04 3.3E 04	6.5E 04 1.4E 05	1.5E 04 KG 3.2E 04 LB	1.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.9E-01 8.6E-02	1.4E-02 6.2E-03	3.0E-02 KG 1.4E-02 LB
PHOSPHORUS	8.5E 06 1.9E 01	2.4E 01 5.4E 01	1.5E-01 3.2E-01	2.3E 01 KG 5.3E 01 LB	1.5E 01 3.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.1E 02 5.1E 01	7.4E 03 3.4E 03	2.3E 01 KG 1.0E 01 LB
PHOSPHORUS OXYCHLORIDE	4.2E 05 1.0E 06	1.5E 04 3.2E 04	1.4E 04 3.2E 04	1.5E 04 KG 3.2E 04 LB	3.2E 00 7.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	1.9E-01 8.6E-02	5.8E-02 2.7E-02	3.0E-02 KG 1.4E-02 LB
PHOSPHORUS PENTACHLORIDE	4.4E 05 9.7E 05	1.5E 04 3.2E 04	7.7E 03 1.7E 04	1.5E 04 KG 3.2E 04 LB	2.6E 00 6.0E 00	1.3E 01 5.8E 00	9.2E-01 4.2E-01	1.9E-01 8.6E-02	4.5E-02 2.0E-02	3.0E-02 KG 1.4E-02 LB
PHOSPHORUS PENTASULFIDE	9.2E 04 2.0E 05	4.7E 03 1.0E 04	1.6E 03 3.5E 03	2.3E 03 KG 5.0E 03 LB	1.6E 01 3.7E 00	1.4E 01 6.2E 00	9.7E-01 4.4E-01	1.0E 00 4.7E-01	5.2E-01 2.4E-01	2.0E-01 KG 9.0E-02 LB
PHOSPHORUS TRICHLORIDE	7.6E 05 1.7E 06	1.5E 04 3.2E 04	1.3E 04 2.9E 04	1.5E 04 KG 3.2E 04 LB	3.3E 00 7.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	1.9E-01 8.6E-02	6.3E-02 2.9E-02	3.0E-02 KG 1.4E-02 LB
POLYCHLORINATED BIPHENYLS	1.4E 00 3.1E 00	2.4E 01 5.4E 01	2.4E 02 5.3E 02	1.9E 01 LTR 5.4E 00 GAL	3.8E 00 8.4E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.4E 02 1.5E 02	6.9E 00 3.2E 00	6.8E 01 LTR 2.6E 02 GAL
POTASSIUM ARSENATE	3.6E 06 7.9E 06	2.4E 01 5.4E 01	6.3E 02 1.4E 03	2.3E 01 KG 5.4E 01 LB	1.5E 01 3.3E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	1.9E 02 8.4E 01	1.6E 00 7.5E-01	3.7E 01 KG 1.7E 01 LB
POTASSIUM ARSENITE	9.4E 04 2.1E 05	4.4E 01 9.4E 01	1.7E 03 3.6E 03	2.3E 01 KG 5.2E 01 LB	1.4E 01 3.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.9E 02 8.4E 01	6.3E-01 2.9E-01	3.7E 01 KG 1.7E 01 LB
POTASSIUM BICHROMATE	4.1E 05 9.1E 05	1.5E 04 3.2E 04	7.1E 03 1.6E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	3.1E-01 1.4E-01	1.2E-01 5.3E-02	5.9E-02 KG 2.7E-02 LB
POTASSIUM CHROMATE	5.4E 05 1.2E 06	1.5E 04 3.2E 04	9.4E 03 2.1E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	3.1E-01 1.4E-01	8.9E-02 4.1E-02	5.9E-02 KG 2.7E-02 LB
POTASSIUM CYANIDE	4.9E 02 1.5E 03	2.4E 01 5.4E 01	1.2E 01 2.7E 01	2.3E 01 KG 5.4E 01 LB	1.3E 01 2.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.1E 02 5.1E 01	6.9E 01 3.1E 01	2.3E 01 KG 1.0E 01 LB
POTASSIUM HYDROXIDE	1.5E 05 3.2E 05	2.7E 03 5.9E 03	2.6E 03 5.7E 03	2.3E 03 KG 5.0E 03 LB	1.8E 01 4.0E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	1.0E 00 4.7E-01	5.3E-01 1.5E-01	2.0E-01 KG 9.0E-02 LB
POTASSIUM PERMANGANATE	6.4E 03 1.4E 04	2.7E 02 5.9E 02	1.1E 02 2.5E 02	2.3E 02 KG 5.0E 02 LB	1.4E 01 3.1E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.7E 01 7.7E 00	7.5E 00 3.4E 00	3.2E 00 KG 1.5E 00 LB
PROPIONIC ACID	5.2E 05 1.1E 06	1.5E 04 3.2E 04	9.1E 03 2.0E 04	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 2.5E 00	1.4E 01 6.2E 00	1.0E 00 4.7E-01	1.5E-01 7.0E-02	8.8E-02 4.0E-02	3.0E-02 LTR 1.1E-01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PROPIONIC ANHYDRIDE	4.0E 03 1.0E 04	1.5E 04 3.2E 04	8.0E 03 1.8E 04	1.5E 04 KG 3.2E 04 LB	3.1E 01 7.0E 00	1.5E 01 6.6E 00	1.0E 00 4.7E-01	1.5E-01 7.0E-02	1.0E-01 4.5E-02	3.0E-02 KG 1.3E-02 LB
PROPYL ALCOHOL	1.7E 07 2.0E 07	4.0E-01 1.0E-01	2.0E 05 4.5E 05	8.8E-01 LTN 3.0E-01 GAL	6.0E 00 1.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.8E-01 8.0E-01	3.9E-03 1.8E-03	2.6E-01 LTN 6.8E-01 GAL
PYRETHRINS (PURE)	2.1E 05 4.5E 05	2.7E 03 5.9E 03	3.0E 03 7.0E 03	2.1E 03 LTN 5.5E 02 GAL	6.0E 00 1.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.7E 00 7.7E-01	3.0E-01 1.3E-01	3.2E-01 LTN 1.2E 00 GAL
PYRETHRINS (+ETTABLE)	2.1E 05 4.5E 05	2.7E 03 5.9E 03	3.0E 03 7.0E 03	2.1E 03 LTN 5.5E 02 GAL	2.3E 01 5.0E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.7E 00 7.7E-01	2.5E-01 1.1E-01	3.2E-01 LTN 1.2E 00 GAL
PYROGALLIC ACID	5.0E 04 1.1E 05	2.7E 02 5.9E 02	8.7E 02 1.9E 03	2.3E 02 KG 5.0E 02 LB	2.5E 01 5.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.7E 01 7.7E 00	1.3E 00 5.7E-01	3.2E 00 KG 1.5E 00 LB
QUINOLINE	1.4E 06 3.1E 06	2.4E 01 5.0E 01	2.4E 02 5.3E 02	1.9E 01 LTN 5.0E 00 GAL	2.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	9.3E 01 4.2E 01	3.5E 00 1.0E 00	1.8E 01 LTN 7.0E 01 GAL
RESORCINOL	9.7E 04 2.1E 05	2.7E 02 5.9E 02	1.7E 03 3.7E 03	2.3E 02 KG 5.0E 02 LB	6.0E 00 1.5E 00	1.3E 01 5.9E 00	9.3E-01 4.2E-01	1.8E 01 4.7E 00	6.9E-01 2.9E-01	2.0E 00 KG 9.0E-01 LB
SELENIC ACID	7.2E 04 1.6E 05	2.0E 01 5.0E 01	1.3E 03 2.8E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.5E 02 7.0E 01	6.7E-01 3.0E-01	3.1E 01 KG 1.4E 01 LB
SELENIUM OXIDE	3.5E 04 7.3E 04	2.0E 01 5.0E 01	5.0E 02 1.3E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.9E 00	2.0E 01 9.2E 00	1.4E 00 6.0E-01	1.5E 02 7.0E 01	1.4E 00 6.5E-01	9.1E 01 KG 1.4E 01 LB
SEVIN (PURE)	8.1E 03 1.8E 04	2.7E 02 5.9E 02	1.9E 02 3.2E 02	2.3E 02 KG 5.3E 02 LB	1.2E 01 5.3E 00	1.5E 01 7.2E 00	1.1E 00 5.0E-01	1.7E 01 7.7E 00	7.4E 00 3.4E 00	3.2E 00 KG 1.5E 00 LB
SEVIN (+ETTABLE)	8.1E 03 1.8E 04	2.7E 02 5.9E 02	1.5E 02 3.2E 02	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.3E 00	1.4E 01 7.3E 00	1.2E 00 5.2E-01	1.7E 01 7.7E 00	5.8E 00 2.6E 00	3.2E 00 KG 1.5E 00 LB
SODIUM	1.1E 05 2.4E 05	2.7E 03 5.9E 03	1.9E 03 4.2E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.6E 00	1.4E 01 6.1E 00	9.7E-01 4.4E-01	8.4E-01 3.8E-01	4.0E-01 2.0E-01	1.6E-01 KG 7.3E-02 LB
SODIUM ARSENATE	7.0E 04 1.7E 05	2.4E 01 5.4E 01	1.4E 03 3.2E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.9E 02 8.4E 01	8.2E-01 2.8E-01	3.7E 01 KG 1.7E 01 LB
SODIUM ARSENITE	9.7E 04 2.1E 05	2.4E 01 5.4E 01	1.7E 03 3.7E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.9E 02 8.4E 01	8.9E-01 2.2E-01	3.7E 01 KG 1.7E 01 LB
SODIUM BICHROMATE	4.1E 05 9.1E 05	1.5E 04 3.2E 04	7.2E 03 1.6E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 2.5E 00	1.6E 01 7.0E 00	1.2E 00 5.3E-01	3.1E-01 1.4E-01	9.3E-02 4.2E-02	5.9E-02 KG 2.7E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	INCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	INCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
SODIUM BIFLUORIDE	6.1E 05 1.4E 06	1.5E 04 3.2E 04	1.1E 00 2.4E 00	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 4.7E 00	1.0E 00 4.8E-01	3.1E-01 1.4E-01	7.0E-02 3.2E-02	9.9E-02 KG 2.7E-02 LB
SODIUM BISULFITE	4.7E 05 1.5E 06	1.5E 04 3.2E 04	1.2E 00 2.6E 00	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	1.9E-01 8.6E-02	7.2E-02 3.3E-02	9.8E-02 KG 1.6E-02 LB
SODIUM CHROMATE	9.9E 05 2.1E 06	1.5E 04 3.2E 04	1.7E 00 3.7E 00	1.5E 04 KG 3.2E 04 LB	1.8E 01 6.6E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	3.1E-01 1.4E-01	5.1E-02 2.3E-02	9.9E-02 KG 2.7E-02 LB
SODIUM CYANIDE	5.9E 02 1.2E 03	2.4E 01 5.0E 01	9.2E 00 2.0E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.4E-01	1.1E 02 5.1E 01	7.3E 01 3.3E 01	2.3E 01 KG 1.0E 01 LB
SODIUM DODECYLBEN-ZENE BISULFONATE	2.0E 04 4.2E 04	2.7E 03 5.9E 03	4.9E 02 1.1E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.0E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.0E 00 4.7E-01	1.7E 00 7.0E-01	2.0E-01 KG 9.0E-02 LB
SODIUM FLUORIDE	8.3E 05 1.8E 06	1.5E 04 3.2E 04	1.5E 00 3.2E 00	1.5E 04 KG 3.2E 04 LB	1.0E 01 4.7E 00	1.0E 01 6.3E 00	9.0E-01 4.5E-01	3.1E-01 1.4E-01	5.0E-02 2.0E-02	9.9E-02 KG 2.7E-02 LB
SODIUM HYDRO-SULFIDE	2.0E 04 4.1E 04	2.7E 03 5.9E 03	4.9E 02 1.1E 03	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.0E 00 4.7E-01	1.7E 00 7.9E-01	2.0E-01 KG 9.0E-02 LB
SODIUM HYDROXIDE	1.9E 05 4.1E 05	2.7E 03 5.9E 03	5.3E 01 7.2E 03	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	1.0E 00 4.7E-01	2.6E-01 1.2E-01	2.0E-01 KG 9.0E-02 LB
SODIUM HYPOCHLORITE	5.8E 03 1.3E 04	2.7E 02 5.9E 02	1.0E 02 2.2E 02	2.3E 02 KG 5.0E 02 LB	1.1E 01 4.9E 00	1.4E 01 6.5E 00	1.0E 00 4.6E-01	8.4E 00 3.8E 00	6.6E 00 3.0E 00	1.6E 00 KG 7.3E-01 LB
SODIUM METHYLATE	2.5E 05 5.5E 05	2.7E 03 5.9E 03	4.9E 03 9.0E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	8.4E-01 3.8E-01	1.9E-01 8.7E-02	1.6E-01 KG 7.3E-02 LB
SODIUM NITRITE	2.1E 04 4.6E 04	2.7E 02 5.9E 02	3.4E 02 8.2E 02	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E 01 4.7E 00	2.1E 00 1.0E 00	2.0E 00 KG 9.2E-01 LB
SODIUM PHOSPHATE MONOBASIC	2.0E 06 4.4E 06	1.5E 04 3.2E 04	3.5E 00 7.7E 00	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.9E-01 8.6E-02	2.4E-02 1.1E-02	3.0E-02 KG 1.0E-02 LB
SODIUM PHOSPHATE DIBASIC	1.2E 06 2.6E 06	1.5E 04 3.2E 04	2.1E 00 4.6E 00	1.5E 04 KG 3.2E 04 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	1.9E-01 8.6E-02	3.2E-02 1.5E-02	3.0E-02 KG 1.0E-02 LB
SODIUM PHOSPHATE TRIBASIC	4.2E 05 9.2E 05	1.5E 04 3.2E 04	7.3E 03 1.6E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	1.9E-01 8.6E-02	1.1E-01 5.2E-02	3.0E-02 KG 1.0E-02 LB
SODIUM SELENITE	1.5E 05 3.4E 05	2.4E 01 5.4E 01	2.7E 03 5.9E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	1.5E 02 7.0E 01	3.1E-01 1.4E-01	3.1E 01 KG 1.4E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
SODIUM SULFIDE	1.7E 05 3.7E 05	2.7E 03 5.9E 03	5.0E 03 4.5E 03	2.5E 03 KG 5.0E 03 LB	1.4E 01 3.2E 00	1.4E 01 8.2E 00	1.3E 00 5.9E-01	1.0E 00 4.7E-01	2.8E-01 1.5E-01	2.0E-01 KG 9.0E-02 LB
STRONTIUM CHROMATE	5.7E 05 1.2E 06	1.3E 04 5.2E 04	9.9E 03 2.2E 04	1.5E 04 KG 3.2E 04 LB	1.4E 01 3.7E 00	1.4E 01 6.2E 00	9.7E-01 4.4E-01	3.1E-01 1.4E-01	1.1E-01 5.0E-02	9.9E-02 KG 2.7E-02 LB
STRYCHNINE	8.7E 05 1.9E 06	2.7E 02 5.9E 02	4.5E 01 1.0E 02	2.5E 02 KG 5.0E 02 LB	1.4E 01 3.5E 00	1.8E 01 8.3E 00	1.3E 00 6.0E-01	1.7E 01 7.7E 00	1.5E 01 5.9E 00	5.2E 00 KG 1.5E 00 LB
STYRENE	1.0E 05 2.2E 05	2.7E 03 5.9E 03	2.5E 03 5.4E 03	2.1E 03 LTR 5.5E 02 GAL	1.4E 01 3.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	3.7E-01 1.7E-01	6.6E-02 3.0E-02	7.2E-02 LTR 2.7E-01 GAL
SULFURIC ACID	4.7E 05 1.0E 06	2.7E 03 5.9E 03	1.0E 04 2.1E 04	2.3E 03 KG 5.0E 03 LB	1.4E 00 3.5E 00	1.3E 01 5.7E 00	9.6E-01 4.1E-01	1.2E 02 4.7E-01	7.7E-02 3.5E-02	2.2E-01 KG 9.2E-02 LB
SULFUR MONOCHLORIDE	1.1E 06 2.5E 06	2.7E 02 5.9E 02	2.2E 04 4.5E 04	2.5E 02 KG 5.0E 02 LB	1.4E 00 3.1E 00	1.2E 01 5.5E 00	8.6E-01 3.9E-01	8.4E 00 2.0E-01	6.3E-02 2.0E-02	1.6E 00 KG 7.3E-01 LB
2,4,5-T ACID (ESTER)	1.9E 05 4.0E 05	2.4E 01 5.4E 01	4.0E 02 1.5E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.1E 02 5.1E 01	1.6E 02 7.2E 01	2.3E 01 KG 1.0E 01 LB
2,4,5-T ACID (+ETTABLE)	3.9E 04 8.0E 04	2.4E 01 5.4E 01	4.0E 02 1.5E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	1.1E 02 5.1E 01	1.2E 04 5.6E-01	2.3E 01 KG 1.0E 01 LB
2,4,5-T ESTERS (PLANT)	8.7E 04 1.9E 05	2.7E 03 5.9E 03	8.5E 02 1.9E 03	2.3E 03 KG 5.2E 03 LB	1.1E 01 3.2E 00	1.5E 01 6.7E 00	1.0E 00 4.4E-01	1.0E 02 4.7E-01	1.3E 02 5.9E-01	2.0E-01 KG 9.0E-02 LB
2,4,5-T ESTERS (+ETTABLE)	8.7E 04 1.9E 05	2.7E 03 5.9E 03	8.5E 02 1.8E 03	2.3E 03 KG 5.2E 03 LB	1.3E 01 3.0E 00	1.7E 01 7.8E 00	1.2E 00 5.5E-01	1.2E 02 4.7E-01	1.0E 02 4.6E-01	2.0E-01 KG 9.2E-02 LB
TANNIC ACID	1.0E 05 2.3E 05	2.7E 03 5.9E 03	1.9E 03 4.2E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.4E 02 6.4E-01	3.7E-01 1.7E-01	2.7E-01 KG 1.2E-01 LB
TDE (PLANT)	1.7E 02 3.6E 02	2.4E 01 5.4E 01	2.0E 00 4.5E 00	2.5E 01 KG 5.0E 01 LB	1.6E 01 3.5E 00	2.2E 01 1.0E 01	1.6E 00 7.1E-01	3.4E 02 1.5E 02	6.9E 02 3.0E 02	6.4E 01 KG 3.1E 01 LB
TDE (+ETTABLE)	1.7E 02 3.6E 02	2.4E 01 5.4E 01	2.0E 00 4.5E 00	2.5E 01 KG 5.0E 01 LB	1.4E 01 3.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	3.7E 02 1.7E 02	5.4E 02 2.5E 02	7.4E 01 KG 3.5E 01 LB
TETRAETHYL LEAD	5.5E 02 1.2E 03	2.4E 01 5.4E 01	9.7E 00 2.1E 01	1.9E 01 LTR 5.3E 00 GAL	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.9E 02 8.4E 01	1.7E 02 7.9E 01	3.7E 01 LTR 1.4E 02 GAL
TETRAETHYL PYROPHOSPHATE	2.3E 03 5.1E 03	2.4E 01 5.4E 01	4.1E 01 9.0E 01	1.9E 01 LTR 5.0E 00 GAL	1.1E 01 4.9E 00	1.4E 01 6.6E 00	1.0E 00 4.7E-01	9.3E 01 4.2E 01	2.0E 01 8.9E 00	1.0E 01 LTR 7.0E 01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
TOLUENE	9.2E 04 2.0E 05	2.7E 03 5.9E 03	1.6E 03 3.5E 03	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 2.4E 01	1.4E 01 3.0E 01	1.0E 00 4.7E-01	3.7E-01 1.7E-01	6.7E-01 3.1E-01	7.2E-02 LTR 2.7E-01 GAL
TOXAPHENE (PURE)	1.2E 02 2.6E 02	2.4E 01 5.3E 01	2.2E 00 1.0E 00	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.3E 01	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.9E 02 8.4E 01	7.7E 02 3.5E 02	3.7E 01 KG 1.7E 01 LB
TOXAPHENE (WETTABLE)	1.2E 02 2.6E 02	2.4E 01 5.3E 01	2.2E 00 4.8E 00	2.3E 01 KG 5.0E 01 LB	1.8E 01 3.9E 01	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.9E 02 8.4E 01	6.8E 02 2.7E 02	3.7E 01 KG 1.7E 01 LB
TRICHLORON	5.4E 05 1.1E 06	1.5E 04 3.2E 04	9.7E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	3.1E-01 1.4E-01	1.3E-01 5.7E-02	5.9E-02 KG 2.7E-02 LB
TRICHLOROPHENOL	2.6E 02 5.1E 02	2.4E 01 5.4E 01	4.9E 00 1.1E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	1.1E 02 5.1E 01	2.2E 02 1.0E 02	2.3E 01 KG 1.0E 01 LB
TRIETHANOLAMINE DODECYLBENZENE SULFONATE	3.6E 04 7.9E 04	2.7E 03 5.9E 03	4.3E 02 1.4E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	1.8E 00 4.7E-01	1.3E 00 6.0E-01	2.3E-01 KG 9.7E-02 LB
TRIETHYLAMINE	2.2E 05 4.9E 05	2.7E 03 5.9E 03	1.9E 03 4.5E 03	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.8E 01 8.3E 00	1.3E 00 6.0E-01	5.6E-01 2.6E-01	2.1E-01 9.4E-02	1.1E-01 KG 4.9E-02 LB
TRIMETHYLAMINE	1.5E 05 2.9E 05	2.7E 03 5.9E 03	2.3E 03 5.1E 03	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.5E 00	1.6E 01 7.3E 00	1.2E 00 5.2E-01	5.0E-01 2.6E-01	2.0E-01 1.5E-01	1.1E-01 KG 4.9E-02 LB
URANIUM PEROXIDE	3.0E 05 6.6E 05	1.5E 04 3.2E 04	5.2E 03 1.2E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	5.1E-01 1.4E-01	2.1E-01 9.4E-02	9.9E-02 KG 2.7E-02 LB
URANYL ACETATE	4.9E 05 1.1E 06	1.5E 04 3.2E 04	8.6E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	3.1E-01 1.4E-01	1.2E-01 5.5E-02	5.9E-02 KG 2.7E-02 LB
URANYL NITRATE	4.1E 05 9.1E 05	1.5E 04 3.2E 04	7.2E 03 1.5E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	3.1E-01 1.4E-01	1.4E-01 6.5E-02	5.9E-02 KG 2.7E-02 LB
URANYL SULFATE	3.7E 05 8.3E 05	1.5E 04 3.2E 04	4.6E 03 1.4E 04	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	3.1E-01 1.4E-01	1.6E-01 7.2E-02	5.9E-02 KG 2.7E-02 LB
VANADIUM OXYTRICHLORIDE	2.9E 05 6.6E 05	1.5E 04 3.2E 04	5.1E 03 1.1E 04	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	3.1E-01 1.4E-01	2.1E-01 9.7E-02	5.9E-02 KG 2.7E-02 LB
VANADIUM PENTOXIDE	1.5E 05 3.4E 05	2.7E 03 5.9E 03	2.7E 03 5.9E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.7E 00 7.7E-01	3.9E-01 1.8E-01	3.2E-01 KG 1.5E-01 LB
VANADYL SULFATE	1.5E 05 3.4E 05	2.7E 03 5.9E 03	2.7E 03 5.9E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.7E 00 7.7E-01	3.9E-01 1.8E-01	3.2E-01 KG 1.5E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
VINYL ACETATE	1.0E 05 3.1E 05	2.7E 03 5.9E 03	2.4E 03 5.3E 03	2.1E 03 LTN 5.3E 02 GAL	1.1E 01 3.6E 00	1.9E 01 7.2E 00	1.1E 00 5.2E-01	8.0E-01 3.0E-01	2.7E-01 1.2E-01	1.0E-01 LTN 4.1E-01 GAL
XYLENE	8.5E 04 1.9E 05	2.7E 03 5.9E 03	1.5E 03 3.2E 03	2.1E 03 LTN 5.3E 02 GAL	9.1E 00 4.7E 00	1.2E 01 5.5E 00	8.7E-01 3.9E-01	7.5E-01 3.4E-01	1.3E-01 2.1E-01	1.4E-01 LTN 5.4E-01 GAL
XYLENOL	1.0E 05 2.2E 05	2.7E 03 5.9E 03	1.7E 03 3.8E 03	2.1E 03 LTN 5.3E 02 GAL	1.1E 01 3.7E 00	1.8E 01 7.3E 00	1.2E 00 5.2E-01	1.3E 00 4.7E-01	4.8E-01 2.2E-01	2.3E-01 LTN 7.5E-01 GAL
ZECTRAN (PURE)	9.1E 04 9.9E 04	2.7E 03 5.9E 03	5.4E 02 1.2E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 3.9E 00	1.4E 01 7.7E 00	1.1E 00 5.2E-01	1.7E 00 7.7E-01	2.2E-01 9.7E-01	3.2E-01 KG 1.5E-01 LB
ZECTRAN (WETTABLE)	3.1E 04 4.9E 04	2.7E 03 5.9E 03	5.4E 02 1.2E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.7E 00 7.7E-01	1.5E 00 7.0E-01	3.2E-01 KG 1.5E-01 LB
ZINC ACETATE	8.9E 04 2.0E 05	2.7E 03 5.9E 03	1.6E 03 3.6E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.7E 00 7.7E-01	6.7E-01 3.0E-01	3.2E-01 KG 1.5E-01 LB
ZINC AMMONIUM CHLORIDE	7.2E 04 1.6E 05	2.7E 03 5.9E 03	1.3E 03 2.9E 03	2.3E 03 KG 5.2E 03 LB	8.5E 00 4.6E 00	1.2E 01 5.7E 00	8.4E-01 3.9E-01	1.7E 00 7.7E-01	9.2E-01 3.7E-01	3.2E-01 KG 1.5E-01 LB
ZINC BICHROMATE	1.4E 04 3.2E 04	2.7E 03 5.9E 03	2.4E 03 5.2E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 5.0E 00	1.7E 01 7.4E 00	1.2E 00 5.4E-01	1.7E 00 7.7E-01	1.4E-01 2.0E-01	3.2E-01 KG 1.5E-01 LB
ZINC BORATE	5.3E 04 1.2E 05	2.7E 03 5.9E 03	9.2E 02 2.0E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.7E 00 7.7E-01	1.1E 00 5.1E-01	3.2E-01 KG 1.5E-01 LB
ZINC BROMIDE	9.2E 04 2.0E 05	2.7E 03 5.9E 03	1.6E 03 3.5E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.7E 00 7.7E-01	6.5E-01 2.9E-01	3.2E-01 KG 1.5E-01 LB
ZINC CARBONATE	5.0E 03 1.1E 05	2.7E 03 5.9E 03	8.7E 02 1.9E 03	2.3E 03 KG 5.2E 03 LB	8.5E 00 4.6E 00	1.2E 01 5.5E 00	8.4E-01 3.8E-01	1.7E 00 7.7E-01	1.2E 00 5.4E-01	3.2E-01 KG 1.5E-01 LB
ZINC CHLORIDE	5.5E 04 1.2E 05	2.7E 03 5.9E 03	9.7E 02 2.1E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 6.7E 00	2.0E 01 9.7E 00	1.4E 00 6.4E-01	1.7E 00 7.7E-01	1.1E 00 4.9E-01	3.2E-01 KG 1.5E-01 LB
ZINC CYANIDE	4.4E 02 1.0E 03	2.4E 01 5.4E 01	1.1E 01 2.5E 01	2.3E 01 KG 5.2E 01 LB	1.0E 01 6.5E 00	1.4E 01 8.5E 00	1.3E 00 6.1E-01	1.1E 02 5.1E 01	9.7E 01 4.4E 01	2.3E 01 KG 1.0E 01 LB
ZINC FLOURIDE	7.2E 04 1.6E 05	2.7E 03 5.9E 03	1.3E 03 2.8E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 6.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.7E 00 7.7E-01	8.2E-01 3.7E-01	3.2E-01 KG 1.5E-01 LB
ZINC FORMATE	6.4E 04 1.4E 05	2.7E 03 5.9E 03	1.1E 03 2.5E 03	2.3E 03 KG 5.2E 03 LB	1.0E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.7E 00 7.7E-01	9.3E-01 4.2E-01	3.2E-01 KG 1.5E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR ESTUARIES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ZINC HYDROSULFITE	8.7E 04 1.9E 05	2.7E 03 5.9E 03	1.0E 03 3.1E 03	2.3E 03 KG 5.3E 03 LB	1.4E 01 3.4E 01	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.7E 00 7.7E-01	7.4E-01 3.3E-01	3.2E-01 KG 1.5E-01 LB
ZINC NITRATE	1.0E 05 2.2E 05	2.7E 03 5.9E 03	2.1E 03 6.6E 03	2.3E 03 KG 5.3E 03 LB	1.4E 01 3.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.7E 00 7.7E-01	5.6E-01 2.5E-01	3.2E-01 KG 1.5E-01 LB
ZINC PERMANGANATE	1.7E 05 3.7E 05	2.7E 03 5.9E 03	2.9E 03 6.4E 03	2.3E 03 KG 5.3E 03 LB	1.5E 01 3.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.7E 00 7.7E-01	3.6E-01 1.6E-01	3.2E-01 KG 1.5E-01 LB
ZINC PHENOL-SULFONATE	2.2E 05 5.0E 05	2.7E 03 5.9E 03	3.9E 03 8.7E 03	2.3E 03 KG 5.3E 03 LB	1.3E 01 3.0E 00	1.8E 01 8.2E 00	1.3E 00 5.7E-01	1.7E 00 7.7E-01	2.6E-01 1.2E-01	3.2E-01 KG 1.5E-01 LB
ZINC PHOSPHIDE	3.6E 04 7.9E 04	2.7E 03 5.9E 03	4.3E 02 1.0E 03	2.3E 03 KG 5.3E 03 LB	1.3E 01 3.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.7E 00 7.7E-01	1.7E 00 7.8E-01	3.2E-01 KG 1.5E-01 LB
ZINC POTASSIUM CHROMATE	1.5E 05 3.4E 05	2.7E 03 5.9E 03	2.7E 03 5.9E 03	2.3E 03 KG 5.3E 03 LB	1.2E 01 2.9E 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	1.7E 00 7.7E-01	4.9E-01 1.8E-01	3.2E-01 KG 1.5E-01 LB
ZINC PROPIONATE	9.4E 04 1.9E 05	2.7E 03 5.9E 03	1.5E 03 3.3E 03	2.3E 03 KG 5.3E 03 LB	1.4E 01 3.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.7E 00 7.7E-01	5.4E-01 2.1E-01	3.2E-01 KG 1.5E-01 LB
ZINC SILICOFLUORIDE	1.5E 05 2.8E 05	2.7E 03 5.9E 03	2.2E 03 4.9E 03	2.3E 03 KG 5.3E 03 LB	1.4E 01 3.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.7E 00 7.7E-01	4.7E-01 2.1E-01	3.2E-01 KG 1.5E-01 LB
ZINC SULFATE	1.2E 05 2.6E 05	2.7E 03 5.9E 03	2.0E 03 4.5E 03	2.3E 03 KG 5.3E 03 LB	1.4E 01 3.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.7E 00 7.7E-01	5.1E-01 2.3E-01	3.2E-01 KG 1.5E-01 LB
ZIRCONIUM ACETATE	8.3E 03 1.7E 04	1.0E 04 3.2E 04	1.5E 04 3.3E 04	1.5E 04 KG 3.2E 04 LB	1.0E 01 2.7E 00	1.4E 01 6.3E 00	9.8E-01 4.5E-01	1.1E-01 1.4E-01	7.0E-02 3.2E-02	5.9E-02 KG 2.7E-02 LB
ZIRCONIUM NITRATE	1.5E 04 3.1E 04	1.5E 04 3.2E 04	2.6E 04 5.8E 04	1.5E 04 KG 3.2E 04 LB	9.6E 00 2.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.1E-01 1.4E-01	3.9E-02 1.8E-02	5.9E-02 KG 2.7E-02 LB
ZIRCONIUM OXY-CHLORIDE	2.7E 04 5.9E 04	1.5E 04 3.2E 04	4.7E 04 1.0E 05	1.5E 04 KG 3.2E 04 LB	8.8E 00 2.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.1E-01 1.4E-01	2.2E-02 1.0E-02	5.9E-02 KG 2.7E-02 LB
ZIRCONIUM POTASSIUM FLUORIDE	7.9E 03 1.7E 04	2.7E 03 5.9E 03	1.4E 04 3.0E 04	2.3E 03 KG 5.0E 03 LB	1.0E 01 2.4E 00	1.4E 01 6.4E 00	1.0E 00 4.5E-01	1.7E 00 7.7E-01	7.5E-02 3.4E-02	3.2E-01 KG 1.5E-01 LB
ZIRCONIUM SULFATE	1.2E 04 2.7E 04	1.5E 04 3.2E 04	2.2E 04 4.8E 04	1.5E 04 KG 3.2E 04 LB	9.2E 00 4.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	1.1E-01 1.4E-01	4.8E-02 2.2E-02	5.9E-02 KG 2.7E-02 LB
ZIRCONIUM TETRA-CHLORIDE	1.9E 04 4.1E 04	2.7E 03 5.9E 03	3.3E 04 7.2E 04	2.3E 03 KG 5.0E 03 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.7E 00 7.7E-01	3.2E-02 1.4E-02	3.2E-01 KG 1.5E-01 LB

TABLE N-4

SUMMARY OF HARMFUL QUANTITIES
AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ACETALDEHYDE	1.9E 05 4.2E 05	1.4E 05 3.1E 05	2.3E 05 5.2E 05	2.1E 03 LTR 5.5E 02 GAL	9.8[illegible] 00 2.5[illegible] 00	1.3E 01 3.9E 00	9.5E-01 4.2E-01	5.4E-03 2.5E-03	1.3E-03 3.0E-04	7.2E-02 LTR 2.7E-01 GAL
ACETIC ACID	8.9E 04 2.0E 05	1.4E 05 3.1E 05	1.1E 05 2.4E 05	2.1E 03 LTR 5.5E 02 GAL	1.1[illegible] 01 4.8[illegible] 00	1.4E 01 6.5E 00	1.0E 00 4.6E-01	8.1E-03 3.7E-03	2.0E-03 1.3E-03	1.1E-01 LTR 4.1E-01 GAL
ACETIC ANHYDRIDE	7.8E 04 1.7E 05	1.4E 05 3.1E 05	9.4E 04 2.1E 05	2.1E 03 LTR 5.5E 02 GAL	1.1[illegible] 01 4.8[illegible] 00	1.4E 01 6.2E 00	1.0E 00 4.6E-01	8.1E-03 3.7E-[illegible]	2.7E-03 1.2E-03	1.1E-01 LTR 4.1E-01 GAL
ACETONE CYANOHYDRIN	[illegible]4E 05 [illegible]1E 05	1.4E 05 3.1E 05	1.7E 05 3.7E 05	2.1E 03 LTR 5.5E 02 GAL	1.4[illegible] 01 6.2[illegible] 00	1.8E 01 8.3E 00	1.3[illegible] 00 5.9E-01	1.0E-02 6.2E-03	1.5E-03 7.0E-04	1.4[illegible]-01 LTR 5.8E-01 GAL
ACETYL BROMIDE	1.9E 04 4.1E 04	1.0E 04 2.2E 04	2.2E 04 4.9E 04	1.5E 04 LTR 4.0E 03 GAL	9.8[illegible] 00 4.4[illegible] 00	1.2E 01 5.5E 00	8.4E-01 3.8E-01	2.2E-03 9.8E-04	7.9E-05 3.6E-05	2.4E-02 LTR 1.0E-01 GAL
ACETYL CHLORIDE	1.3E 04 2.8E 04	1.0E 04 2.2E 04	1.0E 04 2.2E 04	1.5E 04 LTR 4.0E 03 GAL	9.9[illegible] 00 4.2[illegible] 00	1.2E 01 5.4E 00	8.5E-01 3.9E-01	1.5E-03 6.8E-04	1.1E-04 5.1E-05	2.0E-02 LTR 7.5E-02 GAL
ACROLEIN	1.5E 02 3.4E 02	1.7E 03 3.7E 03	1.4E 02 3.1E 02	1.9E 01 LTR 5.0E 00 GA	1.8[illegible] 01 8.2[illegible] 00	2.0E 01 1.1E 01	1.7E 00 7.6E-01	6.9E-01 2.7E-01	1.4E 00 9.4E-01	8.2E 00 LTR 3.1E 01 GA
ACRYLONITRILE	4.1E 04 1.9E 05	1.4E 05 3.1E 05	7.0E 04 1.6E 05	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 5.4E 00	1.4E 01 7.2E 00	1.1E 00 5.1E-01	1.2E-02 5.5E-03	3.5E-03 1.6E-03	1.4E-01 LTR 5.1E-01 GAL
ADIPONITRILE	2.3E 04 5.2E 04	1.4E 05 3.2E 05	2.7E 04 6.2E 04	1.5E 04 LTR 4.0E 03 GAL	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E-03 6.8E-04	9.4E-05 4.3E-05	2.9E-02 LTR 1.5E-02 GAL
ALUM (POWDER)	4.9E 01 1.1E 02	1.7E 03 3.7E 03	8.4E 01 1.9E 02	2.3E 01 KG 5.1E 01 LB	1.4E 01 6.3E 00	1.9E 01 8.3E 00	1.5E 00 6.8E-01	3.7E 00 1.7E 00	2.8E 00 1.3E 00	5.1E 01 KG 2.3E 01 LB
ALUM (CRYSTALLINE)	8.9E 01 1.9E 02	1.7E 03 3.7E 03	8.4E 01 1.8E 02	2.3E 01 KG 5.1E 01 LB	1.8[illegible] 01 8.2[illegible] 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	4.7E 00 1.9E 00	3.4E 00 1.6E 00	5.5E 01 KG 2.5E 01 LB
ALLYL ALCOHOL	1.4E 04 3.1E 04	1.4E 04 3.1E 04	1.7E 04 3.7E 04	2.1E 02 LTR 5.5E 01 GAL	1.5[illegible] 01 6.9[illegible] 00	2.2E 01 9.2E 00	1.5E 00 6.6E-01	9.4E-02 2.5E-02	1.5E-02 7.0E-03	7.2E-01 LTR 2.7E 00 GAL
ALLYL CHLORIDE	6.7E 03 1.5[illegible] 04	1.4E 04 3.1E 04	9.7E 03 2.1E 04	2.1E 02 LTR 5.5E 01 GAL	1.5[illegible] 01 6.9[illegible] 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	8.1E-02 3.7E-02	1.3E-02 5.9E-03	1.1E 00 LTR 4.1E 00 GAL
ALUMINUM FLUORIDE	5.5E 03 1.2E 04	1.7E 04 2.2E 04	8.7E 03 1.9E 04	1.5E 04 KG 3.2E 04 LB	1.1[illegible] 01 5.1[illegible] 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	3.2E-03 1.5E-03	2.5E-04 1.1E-04	4.3E-02 KG 1.9E-02 LB
ALUMINUM SULFATE	8.9E 03 1.9E 04	1.7E 04 2.2E 04	8.4E 03 1.8E 04	1.5E 04 KG 3.2E 04 LB	1.1[illegible] 01 5.0[illegible] 00	1.5E 01 6.6E 00	1.2E 00 6.7E-01	3.2E-03 1.5E-03	2.0E-04 8.9E-05	4.3E-02 KG 1.9E-02 LB

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SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIA	9.0E 03 2.1E 04	1.0E 04 4.1E 04	1.1E 04 2.5E 04	2.3E 02 KG 5.0E 02 LB	1.[illegible] E 01 7.[illegible] E 00	2.1E 01 9.0E 00	1.5E 00 6.8E-01	5.4E-02 2.5E-02	2.3E-02 1.0E-02	7.2E-01 KG 3.3E-01 LB
AMMONIUM ACETATE	6.0E 05 1.5E 06	1.0E 06 2.2E 06	8.0E 05 1.8E 06	1.5E 04 KG 3.2E 04 LB	1.[illegible] E 01 5.[illegible] E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	1.5E-03 6.8E-04	2.9E-04 1.3E-04	2.0E-02 KG 9.0E-03 LB
AMMONIUM BENZOATE	1.7E 06 2.6E 06	1.6E 06 2.2E 06	1.4E 06 3.2E 06	1.5E 04 KG 3.2E 04 LB	9.[illegible] E 00 4.[illegible] E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	2.0E-03 9.4E-04	1.2E-04 5.6E-05	2.0E-02 KG 1.2E-02 LB
AMMONIUM BICARBONATE	6.7E 04 1.5E 05	1.0E 05 4.1E 05	8.0E 04 1.8E 05	2.3E 03 KG 5.0E 03 LB	1.[illegible] E 01 6.[illegible] E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.1E-02 4.9E-03	2.2E-03 1.0E-03	1.0E-01 KG 4.5E-02 LB
AMMONIUM BICHROMATE	3.5E 05 7.7E 05	1.0E 06 2.2E 06	4.2E 05 9.3E 05	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	2.0E-03 9.2E-04	[illegible] [illegible]	2.0E-02 KG 1.2E-02 LB
AMMONIUM BIFLUORIDE	2.4E 05 6.1E 05	1.0E 06 2.2E 06	3.4E 05 7.4E 05	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	2.2E-03 9.2E-04	5.3E-04 2.4E-04	2.0E-02 KG 1.2E-02 LB
AMMONIUM BISULFITE	9.0E 05 2.2E 06	1.0E 06 2.2E 06	1.2E 06 2.6E 06	1.5E 04 KG 3.2E 04 LB	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	2.0E-03 9.0E-04	1.5E-04 6.8E-05	2.0E-02 KG 1.2E-02 LB
AMMONIUM BROMIDE	3.1E 04 6.7E 04	1.0E 05 4.1E 05	3.7E 04 8.1E 04	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.2E 01 9.2E 00	1.6E 00 6.8E-01	1.1E-02 4.9E-03	4.8E-03 2.2E-03	1.0E-01 KG 4.5E-02 LB
AMMONIUM CARBAMATE	2.5E 04 5.5E 04	1.0E 04 4.1E 04	3.0E 04 6.6E 04	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.1E-01 4.9E-02	5.0E-03 2.2E-03	1.0E 00 KG 4.5E-01 LB
AMMONIUM CARBONATE	9.7E 04 2.1E 05	1.0E 06 2.2E 06	1.2E 05 2.6E 05	1.5E 04 KG 3.2E 04 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	2.0E-03 9.0E-04	1.5E-03 6.9E-04	2.0E-02 KG 1.2E-02 LB
AMMONIUM CHLORIDE	1.7E 04 3.7E 04	1.0E 04 4.1E 04	2.0E 04 4.4E 04	2.3E 02 KG 5.0E 02 LB	1.[illegible] E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.1E-01 4.9E-02	0.8E-03 4.0E-03	1.0E 00 KG 4.5E-01 LB
AMMONIUM CHROMATE	6.7E 05 1.5E 06	1.0E 06 2.2E 06	8.0E 05 1.8E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	2.0E-03 9.0E-04	2.2E-04 1.0E-04	2.0E-02 KG 1.2E-02 LB
AMMONIUM CITRATE,	9.9E 05 2.2E 06	1.0E 06 2.2E 06	1.2E 06 2.6E 06	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.0E-03 9.0E-04	1.5E-04 6.7E-05	2.0E-02 KG 1.2E-02 LB
AMMONIUM FLUOBORATE	3.3E 04 7.3E 04	1.0E 05 4.1E 05	4.0E 04 8.9E 04	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.1E-02 4.9E-03	4.6E-03 2.0E-03	1.0E-01 KG 4.5E-02 LB
AMMONIUM FLUORIDE	9.5E 05 1.2E 06	1.0E 06 2.2E 06	6.7E 05 1.5E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	2.0E-03 9.0E-04	2.0E-04 1.2E-04	2.0E-02 KG 1.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIUM FORMATE	5.4E 05 1.2E 06	1.4E 06 2.2E 06	6.5E 05 1.4E 06	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	2.0E-03 9.0E-04	3.6E-04 1.6E-04	2.6E-02 KG 1.2E-02 LB
AMMONIUM HYDROXIDE	4.2E 04 9.2E 04	1.0E 05 4.1E 05	5.0E 04 1.1E 05	2.1E 03 LTR 5.5E 02 GAL	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	1.1E-02 4.9E-03	2.1E-03 2.5E-03	1.4E-01 LTR 5.4E-01 GAL
AMMONIUM HYPOPHOSPHITE	2.4E 04 5.3E 04	1.0E 04 4.1E 04	3.2E 04 6.9E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.1E-01 4.9E-02	2.0E-03 2.0E-03	1.4E 00 KG 6.5E-01 LB
AMMONIUM IODIDE	4.0E 04 9.0E 04	1.0E 05 4.1E 05	5.4E 04 1.2E 05	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.1E-02 4.9E-03	4.0E-03 2.0E-03	1.4E-01 KG 6.5E-02 LB
AMMONIUM MOLYBDATE	3.1E 04 6.7E 04	1.0E 05 4.1E 05	3.7E 04 8.1E 04	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.1E-02 4.9E-03	6.3E-03 2.9E-03	1.4E-01 KG 6.5E-02 LB
AMMONIUM NITRATE	2.5E 04 5.4E 04	1.0E 06 4.1E 06	3.0E 04 6.4E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.1E-01 4.9E-02	5.9E-03 2.7E-03	1.4E 00 KG 6.5E-01 LB
AMMONIUM OXALATE	6.1E 05 1.3E 06	1.2E 06 2.2E 06	7.3E 05 1.6E 06	1.5E 04 KG 3.2E 04 LB	9.2E 00 4.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	2.0E-03 9.0E-04	2.4E-04 1.1E-04	2.4E-02 KG 1.2E-02 LB
AMMONIUM PENTABORATE	8.3E 04 1.8E 05	1.0E 05 4.1E 05	1.0E 05 2.2E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	1.1E-02 4.9E-03	1.0E-03 8.0E-04	1.4E-01 KG 6.5E-02 LB
AMMONIUM PERSULFATE	3.6E 04 7.9E 04	1.0E 05 4.1E 05	4.4E 04 9.4E 04	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.6E 00	1.9E 01 8.8E 00	1.4E 00 6.3E-01	1.1E-02 4.9E-03	5.4E-03 2.4E-03	1.4E-01 KG 6.5E-02 LB
AMMONIUM SILICOFLUORIDE	1.4E 05 3.1E 05	1.0E 05 4.1E 05	1.7E 05 3.7E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.1E-02 4.9E-03	1.1E-03 4.8E-04	1.4E-01 KG 6.5E-02 LB
AMMONIUM SULFAMATE	5.5E 05 1.2E 06	1.2E 06 2.2E 06	6.4E 05 1.5E 06	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	2.0E-03 9.0E-04	3.6E-04 1.6E-04	2.6E-02 KG 1.2E-02 LB
AMMONIUM SULFATE	2.2E 04 4.9E 04	1.0E 04 4.1E 04	2.7E 04 5.9E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.8E 00	2.0E 01 9.0E 00	1.4E 00 6.5E-01	1.1E-01 4.9E-02	6.0E-03 3.0E-03	1.4E 00 KG 6.5E-01 LB
AMMONIUM SULFIDE	6.9E 05 1.5E 06	1.2E 06 2.2E 06	8.3E 05 1.8E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	2.0E-03 9.0E-04	2.1E-04 9.7E-05	2.6E-02 KG 1.2E-02 LB
AMMONIUM SULFITE	6.7E 05 1.5E 06	1.0E 06 2.2E 06	8.0E 05 1.8E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	2.0E-03 9.0E-04	2.2E-04 1.0E-04	2.6E-02 KG 1.2E-02 LB
AMMONIUM TARTRATE	7.9E 05 1.7E 06	1.0E 06 2.2E 06	9.6E 05 2.1E 06	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.0E-03 9.0E-04	1.9E-04 8.4E-05	2.6E-02 KG 1.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
AMMONIUM THIOCYANATE	3.2E 05 7.2E 05	1.0E 06 2.2E 06	3.8E 05 8.4E 05	1.5E 04 KG 3.2E 04 LB	1.3E 01 2.8E 01	1.7E 01 3.7E 01	1.2E 00 5.5E-01	2.0E-03 9.2E-04	6.1E-04 2.8E-04	2.6E-02 KG 1.2E-02 LB
AMMONIUM THIOSULFATE	7.3E 05 1.6E 06	1.0E 06 2.2E 06	4.9E 05 2.2E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.4E 01	1.5E 01 3.4E 01	1.0E 00 4.7E-01	2.2E-03 9.2E-04	2.6E-04 1.2E-04	2.6E-02 KG 1.2E-02 LB
AMYL ACETATE	1.5E 05 3.2E 05	1.0E 05 2.1E 05	1.0E 05 1.9E 05	2.1E 03 LTR 5.5E 02 GAL	1.0E 01 2.2E 01	1.4E 01 3.3E 01	9.8E-01 4.5E-01	5.4E-03 2.5E-03	1.6E-03 7.2E-04	7.2E-02 LTR 2.7E-01 GAL
ANILINE	3.1E 04 6.7E 04	1.0E 05 2.1E 05	3.7E 04 8.1E 04	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 2.6E 01	1.6E 01 3.7E 01	1.1E 00 5.0E-01	8.1E-03 3.7E-03	4.8E-03 2.2E-03	1.1E-01 LTR 4.1E-01 GAL
ANTIMONY PENTACHLORIDE	9.1E 04 1.9E 05	1.0E 05 2.1E 05	7.4E 04 1.6E 05	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.2E 01	2.0E 01 4.5E 01	1.4E 00 6.5E-01	1.0E-02 4.6E-03	2.2E-03 1.0E-03	2.3E-01 KG 1.1E-01 LB
ANTIMONY PENTAFLUORIDE	4.4E 04 9.4E 04	1.0E 05 2.1E 05	5.4E 04 1.2E 05	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.2E 01	2.0E 01 4.5E 01	1.4E 00 6.5E-01	1.0E-02 4.6E-03	3.1E-03 1.4E-03	2.3E-01 KG 1.1E-01 LB
ANTIMONY POTASSIUM TARTRATE	5.9E 04 2.7E 05	1.0E 05 2.1E 05	1.1E 05 2.4E 05	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.2E 01	1.9E 01 4.2E 01	1.4E 00 6.3E-01	1.0E-02 4.6E-03	1.5E-03 7.0E-04	2.3E-01 KG 1.1E-01 LB
ANTIMONY TRICHLORIDE	7.5E 04 1.7E 05	1.0E 05 2.1E 05	9.1E 04 2.0E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.1E 01	2.1E 01 4.6E 01	1.5E 00 6.7E-01	1.0E-02 4.6E-03	1.8E-03 8.3E-04	2.3E-01 KG 1.1E-01 LB
ANTIMONY TRIFLUORIDE	4.7E 04 1.0E 05	1.0E 05 2.1E 05	5.7E 04 1.3E 05	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.3E 01	2.0E 01 4.5E 01	1.4E 00 6.5E-01	1.0E-02 4.6E-03	2.9E-03 1.3E-03	2.3E-01 KG 1.1E-01 LB
ANTIMONY TRIIODIDE	3.6E 04 7.9E 04	1.0E 05 2.1E 05	4.4E 04 9.6E 04	2.3E 03 KG 5.0E 03 LB	1.5E 01 3.2E 01	2.0E 01 4.5E 01	1.4E 00 6.5E-01	1.0E-02 4.6E-03	5.8E-03 1.7E-03	2.3E-01 KG 1.1E-01 LB
ANTIMONY TRISULFIDE	1.7E 05 3.7E 05	1.0E 05 2.1E 05	1.2E 05 2.7E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.0E 01	1.9E 01 4.2E 01	1.4E 00 6.5E-01	1.0E-02 4.6E-03	1.3E-03 6.0E-04	2.3E-01 KG 1.1E-01 LB
ANTIMONY TRIOXIDE	2.9E 05 6.1E 05	1.0E 06 2.2E 06	3.0E 05 7.0E 05	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.4E 01	1.7E 01 3.7E 01	1.2E 00 5.3E-01	3.2E-03 1.5E-03	4.9E-04 2.2E-04	4.3E-02 KG 1.9E-02 LB
ARSENIC ACID	1.2E 04 2.6E 04	1.7E 03 3.7E 03	1.4E 04 3.2E 04	1.9E 01 LTR 5.0E 02 GAL	1.6E 01 3.5E 01	2.1E 01 4.5E 01	1.5E 00 6.8E-01	2.1E 00 9.5E-01	1.1E-02 5.2E-03	2.9E 01 LTR 1.1E 02 GAL
ARSENIC DISULFIDE	1.1E 04 2.4E 04	1.7E 03 3.7E 03	1.3E 04 2.9E 04	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.2E 01	1.8E 01 4.3E 01	1.3E 00 5.9E-01	2.1E 00 9.5E-01	9.6E-03 4.4E-03	2.9E 01 KG 1.3E 01 LB
ARSENIC PENTOXIDE	1.7E 04 3.7E 04	1.7E 03 3.7E 03	2.0E 04 4.4E 04	2.3E 01 KG 5.0E 01 LB	1.6E 01 3.5E 01	2.1E 01 4.5E 01	1.5E 00 6.8E-01	2.1E 00 9.5E-01	6.2E-03 3.7E-03	2.9E 01 KG 1.3E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ARSENIC TRI-BROMIDE	5.3E 04 7.3E 04	1.7E 03 3.7E 03	4.4E 04 9.9E 04	2.3E 01 KG 5.0E 01 LB	1.4E 0 3.3E 0	.8E 01 6.5E 00	1.3E 00 6.0E-01	2.1E 00 9.5E-01	6.1E-03 1.9E-03	2.9E 01 KG 1.3E 01 LB
ARSENIC TRI-CHLORIDE	2.1E 04 4.6E 04	1.7E 03 3.7E 03	2.5E 04 5.5E 04	2.3E 01 KG 5.0E 01 LB	1.5E 0 3.6E 0	1.9E 01 8.8E 00	1.4E 00 6.3E-01	2.1E 00 9.5E-01	6.6E-03 3.0E-03	2.9E 01 KG 1.3E 01 LB
ARSENIC TRI-FLUORIDE	1.7E 03 3.7E 04	1.7E 03 3.7E 03	2.3E 04 4.4E 04	2.3E 01 KG 5.0E 01 LB	1.4E 0 3.5E 0	1.9E 01 8.7E 00	1.4E 00 6.2E-01	2.1E 00 9.5E-01	6.2E-03 3.7E-03	2.9E 01 KG 1.3E 01 LB
ARSENIC TRI-IODIDE	5.0E 04 1.1E 05	1.7E 03 3.7E 03	4.4E 04 1.3E 05	2.3E 01 KG 5.0E 01 LB	1.5E 0 3.7E 0	2.0E 01 8.9E 00	1.4E 00 6.3E-01	2.1E 00 9.5E-01	2.7E-03 1.2E-03	2.9E 01 KG 1.3E 01 LB
ARSENIC TRIOXIDE	1.1E 04 2.4E 04	1.7E 03 3.7E 03	1.3E 04 2.9E 04	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	2.1E 00 9.5E-01	1.3E-02 5.7E-03	2.9E 01 KG 1.3E 01 LB
ARSENIC TRISULFIDE	1.4E 04 3.1E 04	1.7E 03 3.7E 03	1.7E 04 3.7E 04	2.3E 01 KG 5.0E 01 LB	1.8E 00 4.0E 0	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.1E 00 9.5E-01	7.7E-03 3.5E-03	2.9E 01 KG 1.3E 01 LB
BENZENE	5.8E 04 1.3E 05	1.9E 03 4.1E 03	7.4E 04 1.5E 05	2.1E 03 LTR 5.5E 02 GAL	1.2E 0 5.6E 0	1.6E 01 7.4E 00	1.2E 00 5.3E-01	2.7E-03 1.2E-03	1.5E-03 6.8E-04	5.6E-32 LTR 1.4E-31 GAL
BENZOIC ACID	5.7E 03 1.1E 04	1.2E 03 2.2E 03	6.8E 03 1.3E 04	1.5E 04 LTR 4.0E 03 GAL	9.5E 01 4.3E 00	1.3E 01 5.8E 00	9.1E-01 4.1E-01	2.0E-03 9.2E-04	2.9E-04 1.3E-04	2.6E-32 LTR 1.0E-31 GAL
BENZONITRILE	2.2E 04 4.8E 04	1.8E 03 4.1E 03	2.6E 03 5.8E 03	2.3E 03 KG 5.0E 03 LB	1.1E 0 4.9E 0	1.4E 01 6.4E 00	1.0E 00 4.6E-01	8.1E-03 3.7E-03	6.8E-04 3.1E-04	1.1E-01 KG 4.9E-02 LB
BENZYL CHLORIDE	2.4E 04 5.3E 04	1.8E 03 2.2E 03	3.2E 04 6.9E 04	1.5E 04 LTR 4.0E 03 GAL	8.6E 0 4.0E 0	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E-03 6.8E-04	5.4E-05 2.6E-05	2.2E-02 LTR 7.5E-02 GAL
BENZYL CHLORIDE	2.3E 04 5.2E 04	1.8E 03 2.2E 03	2.4E 04 4.2E 04	1.5E 04 LTR 4.0E 03 GAL	9.4E 01 4.2E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.7E-03 7.9E-04	6.6E-05 2.1E-05	2.3E-02 LTR 8.7E-02 GAL
BERYLLIUM CHLORIDE	1.7E 03 4.1E 03	1.4E 03 2.2E 03	4.5E 03 9.6E 03	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	3.2E-03 1.5E-03	3.7E-04 1.7E-04	6.3E-02 KG 1.9E-02 LB
BERYLLIUM FLUORIDE	2.2E 03 4.8E 03	1.4E 03 4.1E 03	2.4E 03 5.8E 03	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	1.8E-02 8.0E-03	6.3E-04 2.9E-04	2.3E-01 KG 1.1E-01 LB
BERYLLIUM HYDROXIDE	1.6E 03 3.5E 03	1.8E 03 4.1E 03	1.9E 03 4.2E 03	2.3E 03 KG 5.0E 03 LB	8.8E 01 4.0E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E-02 6.8E-03	6.7E-04 3.1E-04	2.0E-01 KG 9.0E-02 LB
BERYLLIUM NITRATE	1.2E 04 2.5E 04	1.3E 03 2.2E 03	1.4E 04 3.1E 04	1.5E 04 KG 3.2E 04 LB	1.5E 01 6.6E 01	1.9E 01 8.8E 00	1.4E 00 6.3E-01	3.2E-03 1.5E-03	1.2E-04 5.4E-05	4.3E-02 KG 1.9E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG-LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
BERYLLIUM SULFATE	6.5E 05 1.4E 06	1.2E 06 2.2E 06	7.9E 05 1.7E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 2.1E 02	1.5E 01 6.8E 00	1.1E 02 4.8E-01	3.2E-03 1.5E-03	2.1E-04 9.5E-05	4.5E-02 KG 1.0E-02 LB
BRUCINE	4.7E 03 1.2E 04	1.7E 03 3.7E 03	5.7E 03 1.3E 04	2.3E 01 KG 5.2E 01 LB	1.5E 01 3.9E 02	2.0E 01 9.1E 00	1.4E 02 6.5E-01	2.0E 00 9.2E-01	2.3E-02 1.0E-02	2.0E 01 KG 1.3E 01 LB
BUTYL ACETATE	8.9E 04 2.2E 05	1.9E 05 4.1E 05	1.1E 05 2.4E 05	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 2.1E 02	1.5E 01 6.8E 00	1.1E 02 4.8E-01	8.1E-03 3.7E-03	2.0E-03 1.1E-03	1.1E-01 LTR 4.1E-01 GAL
BUTYL AMINE	5.5E 04 1.2E 05	1.9E 05 4.1E 05	6.7E 04 1.5E 05	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 4.1E 02	1.8E 01 8.1E 00	1.3E 02 5.8E-01	5.0E-03 2.5E-03	4.5E-03 2.0E-03	7.2E-02 LTR 2.7E-01 GAL
BUTYRIC ACID	5.5E 05 1.2E 06	1.8E 06 4.1E 06	6.7E 05 1.5E 06	2.1E 02 LTR 5.5E 01 GAL	1.8E 01 4.5E 02	1.3E 01 6.2E 00	9.5E-01 4.3E-01	8.1E-02 3.7E-02	4.5E-04 2.0E-04	1.1E 00 LTR 4.1E 00 GAL
CADMIUM ACETATE	4.7E 04 1.0E 05	1.7E 03 3.7E 03	5.7E 04 1.3E 05	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.7E 02	2.2E 01 9.2E 00	1.4E 02 6.4E-01	2.1E 00 9.5E-01	5.7E-03 2.6E-03	2.9E 01 KG 1.3E 01 LB
CADMIUM BROMIDE	5.5E 04 1.2E 05	1.7E 03 3.7E 03	6.7E 04 1.5E 05	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 02 6.4E-01	2.1E 00 9.5E-01	4.5E-03 2.1E-03	2.9E 01 KG 1.3E 01 LB
CADMIUM CHLORIDE	3.8E 04 7.9E 04	1.7E 03 3.7E 03	4.4E 04 9.6E 04	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.8E 00	2.0E 01 9.2E 00	1.4E 02 6.4E-01	2.1E 00 9.5E-01	6.9E-03 3.2E-03	2.9E 01 KG 1.3E 01 LB
CADMIUM NITRATE	5.2E 04 1.1E 05	1.7E 03 3.7E 03	6.4E 04 1.3E 05	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.8E 00	2.0E 01 9.2E 00	1.4E 02 6.5E-01	2.1E 00 9.5E-01	5.4E-03 2.3E-03	2.9E 01 KG 1.3E 01 LB
CADMIUM SULFATE	4.2E 04 9.2E 04	1.7E 03 3.7E 03	5.1E 04 1.1E 05	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.8E 00	2.0E 01 9.2E 00	1.4E 02 6.5E-01	2.1E 00 9.5E-01	6.2E-03 2.7E-03	2.9E 01 KG 1.3E 01 LB
CALCIUM ARSENATE	3.1E 04 6.7E 04	1.7E 03 3.7E 03	3.7E 04 8.1E 04	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.5E 00	1.6E 01 7.3E 00	1.2E 02 5.2E-01	2.1E 00 9.5E-01	3.5E-03 1.6E-03	2.9E 01 KG 1.3E 01 LB
CALCIUM ARSENITE	9.4E 04 2.1E 05	1.7E 03 3.7E 03	1.1E 05 2.5E 05	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.8I 00	1.7E 01 7.8E 00	1.2E 02 5.5E-01	2.1E 00 9.5E-01	1.6E-03 7.1E-04	2.9E 01 KG 1.3E 01 LB
CALCIUM CARBIDE	3.6E 05 8.4E 05	1.8E 06 2.2E 06	4.0E 05 1.0E 06	1.5E 04 KG 3.2E 04 LB	9.4I 00 4.3I 02	1.3E 01 5.7E 00	9.9E-01 4.1E-01	2.9E-03 9.2E-04	5.6E-04 1.6E-04	2.6E-02 KG 1.2E-02 LB
CALCIUM CHROMATE	1.3E 06 2.9E 06	1.8E 06 2.2E 06	1.6E 06 3.5E 06	1.5E 04 KG 3.2E 04 LB	9.0I 02 4.1I 04	1.2E 01 5.5E 00	8.6E-01 3.9E-01	3.2E-03 1.5E-03	1.1E-04 5.0E-05	4.3E-02 KG 1.9E-02 LB
CALCIUM CYANIDE	5.2E 02 1.1E 03	1.7E 03 3.7E 03	6.2E 02 1.3E 03	2.3E 01 KG 5.0E 01 LB	1.3I 01 5.9I 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.2E 00 5.4E-01	2.9E-01 1.3E-01	1.0E 01 KG 7.4E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CALCIUM DODECYLBENZENE SULFONATE	3.1E 04 6.7E 04	1.0E 05 4.1E 05	3.7E 04 8.1E 04	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	1.1E-02 4.9E-03	4.0E-03 2.2E-03	1.4E-01 KG 6.5E-02 LB
CALCIUM HYDROXIDE	4.4E 05 9.8E 05	1.0E 06 2.2E 06	5.4E 05 1.2E 06	1.5E 04 KG 3.2E 04 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	6.9E-01 6.0E-01	2.4E-03 9.9E-04	3.3E-04 1.5E-04	2.4E-02 KG 1.2E-02 LB
CALCIUM HYPO-CHLORITE	6.9E 03 1.5E 04	1.4E 04 4.1E 04	5.4E 03 1.0E 04	2.3E 02 KG 5.0E 02 LB	1.1E 01 4.8E 00	1.4E 01 6.4E 00	1.0E 00 4.6E-01	1.1E-01 4.9E-02	2.0E-02 1.3E-02	1.4E 00 KG 6.5E-01 LB
CALCIUM OXIDE	3.4E 05 7.4E 05	1.2E 06 2.2E 06	4.1E 05 8.9E 05	1.5E 04 KG 3.2E 04 LB	9.0E 00 4.5E 00	1.3E 01 5.9E 00	9.3E-01 4.2E-01	2.0E-03 9.0E-04	5.0E-04 2.6E-04	2.0E-02 KG 1.2E-02 LB
CAPTAN (PURE)	8.9E 02 2.0E 03	1.7E 03 3.7E 03	1.1E 03 2.4E 03	2.3E 01 KG 5.0E 01 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	7.5E-01 3.4E-01	1.2E-01 5.5E-02	1.0E 01 KG 4.7E 00 LB
CAPTAN (WETTABLE)	8.9E 02 2.0E 03	1.7E 03 3.7E 03	1.1E 03 2.3E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.2E 00 5.4E-01	1.6E-01 7.5E-02	1.5E 01 KG 7.4E 00 LB
CARBON DISULFIDE	3.7E 05 8.3E 05	1.0E 05 4.1E 05	4.5E 05 1.0E 06	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	8.1E-03 3.7E-03	7.2E-04 3.3E-04	1.1E-01 LTR 4.1E-01 GAL
CATECHOL	3.9E 04 8.4E 04	1.0E 05 4.1E 05	4.7E 04 1.0E 05	2.1E 03 LTR 5.5E 02 GAL	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	1.1E-02 4.9E-03	3.8E-03 1.7E-03	1.4E-01 LTR 5.4E-01 GAL
CHLORINE	2.4E 03 6.1E 03	1.7E 03 3.7E 03	3.4E 03 7.4E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 4.7E 00	1.4E 01 6.3E 00	9.8E-01 4.5E-01	1.2E 00 5.4E-01	7.7E-02 3.5E-02	1.4E 01 KG 7.4E 00 LB
CHLORDANE (PURE)	4.2E 01 9.2E 01	1.7E 03 3.7E 03	5.2E 01 1.1E 02	1.9E 01 LTR 5.0E 00 GAL	1.2E 01 4.7E 00	1.4E 01 6.2E 00	9.7E-01 4.4E-01	3.7E 00 1.7E 00	4.7E 00 2.1E 00	5.1E 01 LTR 2.0E 02 GAL
CHLORDANE (WETTABLE)	4.2E 01 9.2E 01	1.7E 03 3.7E 03	5.0E 01 1.1E 02	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	4.2E 00 1.8E 00	6.5E 00 2.9E 00	5.5E 01 KG 2.5E 01 LB
CHLOROBENZENE	5.5E 04 1.2E 05	1.0E 05 4.1E 05	6.7E 04 1.5E 05	2.1E 02 LTR 5.5E 01 GAL	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.9E-01 8.6E-02	3.5E-03 1.6E-03	2.5E 00 LTR 9.5E 00 GAL
CHLOROFORM	3.5E 05 7.6E 05	1.0E 06 4.1E 06	4.2E 05 9.2E 05	2.1E 02 LTR 5.5E 01 GAL	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	1.9E-01 8.6E-02	5.0E-04 2.0E-04	2.5E 00 LTR 9.5E 00 GAL
CHLOROSULFONIC ACID	9.4E 05 2.1E 06	1.2E 06 2.2E 06	1.2E 06 2.4E 06	1.5E 04 LTR 4.0E 03 GAL	9.2E 00 4.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	2.0E-03 9.0E-04	1.5E-04 6.9E-05	2.0E-02 LTR 1.0E-01 GAL
CHROMIC ACETATE	5.0E 04 1.1E 05	1.0E 05 4.1E 05	6.0E 04 1.3E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.0E-02 8.0E-03	2.9E-03 1.3E-03	2.3E-01 KG 1.1E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES: DOHM (KG-LB)	HARMFUL QUANTITIES: IMCO (KG-LB)	HARMFUL QUANTITIES: RESOURCE VALUE (KG-LB)	HARMFUL QUANTITIES: UNIT OF MEASUREMENT	RATES OF PENALTY: COST OF PREVENTION: STATIONARY SOURCE $/KG(LB)	RATES OF PENALTY: COST OF PREVENTION: BARGE $/KG(LB)	RATES OF PENALTY: COST OF PREVENTION: RAIL $/KG(LB)	RATES OF PENALTY: IMCO $/KG/LB	RATES OF PENALTY: RESOURCE VALUE $/KG(LB)	RATES OF PENALTY: UNIT OF MEASUREMENT $/UNIT
CHROMIC ACID	2.8E 05 6.1E 05	1.8E 05 4.1E 05	3.4E 05 7.4E 05	2.1E 03 LTN 5.5E 02 GAL	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.8E-02 8.2E-03	7.8E-04 3.2E-04	2.5E-01 LTN 8.2E-01 GAL
CHROMIC SULFATE	7.5E 04 1.7E 05	1.8E 05 4.1E 05	9.1E 04 2.0E 05	2.3E 03 KG 5.3E 03 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.8E-02 8.2E-03	2.3E-03 8.9E-04	2.3E-01 KG 1.1E-01 LB
CHROMOUS CARBONATE	2.5E 04 5.5E 04	1.4E 05 4.1E 05	3.4E 04 6.6E 04	2.3E 03 KG 5.4E 03 LB	1.4E 01 6.3E 00	1.9E 01 8.4E 00	1.3E 00 6.2E-01	1.8E-02 8.2E-03	4.3E-03 1.9E-03	2.3E-01 KG 1.1E-01 LB
CHROMOUS CHLORIDE	2.5E 04 5.5E 04	1.4E 04 4.1E 04	3.4E 04 6.6E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	1.8E-01 8.2E-02	5.9E-03 2.7E-03	2.3E 00 KG 1.1E 00 LB
CHROMOUS OXALATE	3.5E 04 7.3E 04	1.9E 05 4.1E 05	4.8E 04 8.9E 04	2.3E 03 KG 5.0E 03 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.8E-02 8.0E-03	4.4E-03 2.0E-03	2.3E-01 KG 1.1E-01 LB
CHROMYL CHLORIDE	4.5E 05 9.5E 05	1.0E 06 2.2E 06	5.2E 05 1.1E 06	1.5E 04 KG 3.2E 04 LB	1.8E 01 8.0E 00	2.4E 01 1.1E 01	1.7E 00 7.6E-01	3.2E-03 1.5E-03	3.4E-04 1.4E-04	4.3E-02 KG 1.9E-02 LB
COBALTOUS ACETATE	2.3E 04 5.1E 04	1.0E 05 2.2E 05	2.4E 04 4.2E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	5.9E-05 2.7E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS BROMIDE	2.1E 04 4.5E 04	1.0E 05 2.2E 05	2.5E 04 5.5E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	6.0E-05 3.0E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS CHLORIDE	2.2E 04 4.9E 04	1.0E 05 2.2E 05	2.7E 04 5.9E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	6.2E-05 2.8E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS CITRATE	1.9E 04 4.1E 04	1.0E 05 2.2E 05	2.2E 04 4.9E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	7.4E-05 3.3E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS FLUORIDE	1.2E 04 2.9E 04	1.0E 05 2.2E 05	1.5E 04 3.3E 04	1.5E 04 KG 3.2E 04 LB	9.2E 00 4.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	3.2E-03 1.5E-03	1.1E-04 5.0E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS FORMATE	1.7E 04 3.9E 04	1.0E 05 2.2E 05	2.1E 04 4.6E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	7.0E-05 3.0E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS IODIDE	2.9E 04 6.4E 04	4.2E-01 8.8E-01	3.5E 04 7.8E 04	8.8E-01 KG 8.8E-01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.8E-01 4.0E-01	4.7E-05 2.1E-05	8.8E-01 KG 8.8E-01 LB
COBALTOUS NITRATE	2.7E 04 6.0E 04	1.0E 05 2.2E 05	3.3E 04 7.2E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	5.8E-05 2.3E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS PERCHLORATE	3.4E 04 7.6E 04	4.8E-01 8.8E-01	4.2E 04 9.1E 04	8.8E-01 KG 8.8E-01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.8E-01 8.8E-01	4.6E-05 1.8E-05	8.8E-01 KG 8.8E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
COBALTOUS SUCCINATE	1.1E 04 2.4E 04	1.0E 04 2.2E 04	1.3E 04 3.0E 04	1.5E 04 KG 3.3E 04 LB	8.8E 00 1.9E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	9.6E-05 4.4E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS SULFAMATE	2.2E 04 4.9E 04	1.0E 04 2.2E 04	2.7E 04 5.9E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 1.9E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	6.2E-05 2.8E-05	4.3E-02 KG 1.9E-02 LB
COBALTOUS SULFATE	2.7E 04 5.9E 04	1.0E 04 2.2E 04	3.2E 04 7.1E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 1.9E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	5.1E-05 2.3E-05	4.3E-02 KG 1.9E-02 LB
COUMAPHOS (PURE)	5.1E 02 1.1E 03	1.7E 03 3.7E 03	3.7E 02 8.1E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 2.8E 01	1.7E 01 3.7E 00	1.2E 00 2.5E-01	1.6E 00 3.5E-01	5.5E-01 1.2E-01	2.3E 01 KG 5.0E 01 LB
COUMAPHOS (WETTABLE)	5.1E 02 1.1E 03	1.7E 03 3.7E 03	3.7E 02 8.1E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 3.3E 01	2.0E 01 4.2E 00	1.5E 00 3.0E-01	1.9E 00 4.0E-01	4.8E-01 1.0E-01	2.7E 01 KG 5.9E 01 LB
CRESOL	1.5E 05 3.3E 05	1.0E 04 2.2E 04	1.8E 05 4.0E 05	2.1E 02 LTN 4.7E 01 GAL	1.2E 01 2.6E 01	1.6E 01 3.4E 00	1.1E 00 2.4E-01	8.1E-02 1.7E-02	9.6E-04 2.1E-04	1.1E 00 LTN 2.4E 00 GAL
CUPRIC ACETATE	1.0E 04 2.2E 04	1.0E 04 2.2E 04	2.0E 04 4.4E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.3E 01	2.1E 01 4.4E 00	1.5E 00 3.2E-01	1.5E-01 3.2E-02	8.3E-03 1.8E-03	2.0E 00 KG 4.4E-01 LB
CUPRIC ACETOARSENITE	2.1E 04 4.7E 04	1.7E 03 3.7E 03	2.4E 04 5.2E 04	2.3E 01 KG 5.0E 01 LB	1.4E 01 3.0E 01	1.9E 01 4.0E 00	1.4E 00 2.9E-01	2.1E 00 4.5E-01	5.0E-03 1.1E-03	2.3E 01 KG 5.0E 01 LB
CUPRIC ACETYL-ACETONATE	2.2E 04 4.8E 04	1.0E 04 2.2E 04	2.4E 04 5.2E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.2E 01	2.0E 01 4.2E 00	1.4E 00 2.9E-01	1.8E-01 3.8E-02	4.9E-03 1.0E-03	2.3E 00 KG 5.0E-01 LB
CUPRIC BROMIDE	1.8E 04 4.0E 04	1.0E 04 2.2E 04	2.2E 04 4.9E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.2E 01	2.1E 01 4.4E 00	1.5E 00 3.2E-01	1.8E-01 3.8E-02	7.5E-03 1.6E-03	2.3E 00 KG 5.0E-01 LB
CUPRIC CHLORIDE	1.4E 04 3.1E 04	1.0E 04 2.2E 04	1.7E 04 3.7E 04	2.3E 02 KG 5.0E 02 LB	1.4E 01 3.0E 01	2.1E 01 4.4E 00	1.5E 00 3.2E-01	1.8E-01 3.8E-02	9.8E-03 2.1E-03	2.3E 00 KG 5.0E-01 LB
CUPRIC FORMATE	1.4E 04 3.1E 04	1.0E 04 2.2E 04	1.7E 04 3.7E 04	2.3E 02 KG 5.0E 02 LB	1.4E 01 3.1E 01	2.1E 01 4.4E 00	1.5E 00 3.2E-01	1.8E-01 3.8E-02	9.8E-03 2.1E-03	2.3E 00 KG 5.0E-01 LB
COPPER GLUCONATE	3.9E 04 8.6E 04	1.8E 05 4.0E 05	4.7E 04 1.0E 05	2.3E 03 KG 5.0E 03 LB	1.7E 01 3.6E 01	2.2E 01 4.8E 00	1.6E 00 3.5E-01	1.8E-02 3.8E-03	3.5E-03 7.6E-04	2.3E-01 KG 5.0E-01 LB
CUPRIC GLYCINATE	1.9E 04 4.2E 04	1.0E 04 2.2E 04	2.3E 04 5.2E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.3E 01	2.0E 01 4.4E 00	1.4E 00 3.0E-01	1.8E-01 3.8E-02	7.0E-03 1.5E-03	2.3E 00 KG 5.0E-01 LB
CUPRIC LACTATE	1.9E 04 4.3E 04	1.0E 04 2.2E 04	2.3E 04 5.2E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 3.3E 01	2.1E 01 4.4E 00	1.5E 00 3.2E-01	1.8E-01 3.8E-02	7.0E-03 1.5E-03	2.3E 00 KG 5.0E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG,LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
CUPRIC NITRATE	1.9E 04 4.3E 04	1.8E 04 4.1E 04	2.5E 04 5.2E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E-01 8.9E-02	7.0E-03 3.2E-03	2.3E 00 KG 1.1E 00 LB
CUPRIC OXALATE	1.3E 04 2.9E 04	1.0E 04 4.1E 04	1.6E 04 3.5E 04	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.5E-01 6.8E-02	8.8E-03 3.6E-03	2.0E 00 KG 9.0E-01 LB
CUPRIC SUBACETATE	1.5E 04 3.4E 04	1.0E 04 4.1E 04	1.0E 04 4.1E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.0E-01 8.9E-02	6.9E-03 4.1E-03	2.3E 00 KG 1.1E 00 LB
CUPRIC SULFATE	2.1E 04 4.5E 04	1.0E 04 4.1E 04	2.5E 04 5.5E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E-01 8.8E-02	6.6E-03 3.0E-03	2.3E 00 KG 1.1E 00 LB
CUPRIC SULFATE AMMONIATED	2.0E 04 4.5E 04	1.0E 04 4.1E 04	2.4E 04 5.4E 04	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E-01 8.8E-02	6.7E-03 3.1E-03	2.3E 00 KG 1.1E 00 LB
CUPRIC TARTRATE	2.0E 04 4.4E 04	1.0E 04 4.1E 04	2.0E 04 4.8E 04	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.5E-01 6.8E-02	8.9E-03 2.2E-03	2.0E 00 KG 9.0E-01 LB
CUPROUS BROMIDE	1.2E 04 2.6E 04	1.0E 04 4.1E 04	1.4E 04 3.2E 04	2.3E 02 KG 5.0E 02 LB	1.4E 01 6.3E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.5E-01 6.8E-02	8.9E-03 6.1E-03	2.2E 00 KG 9.8E-01 LB
CUPROUS IODIDE	1.0E 04 3.0E 04	1.0E 04 4.1E 04	1.9E 04 4.1E 04	2.3E 02 KG 5.0E 02 LB	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	1.5E-01 6.8E-02	6.9E-03 3.1E-03	2.0E 00 KG 9.0E-01 LB
CYANOGEN CHLORIDE	2.2E 02 4.9E 02	1.7E 03 3.7E 03	2.7E 02 5.9E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.8E 00	1.2E 00 5.6E-01	2.1E 00 9.5E-01	1.1E 00 5.1E-01	2.9E 01 KG 1.3E 01 LB
CYCLOHEXANE	9.5E 04 1.9E 05	1.0E 05 4.1E 05	1.0E 05 2.3E 05	2.1E 03 LTR 5.5E 02 GAL	9.1E 00 4.1E 00	1.2E 01 5.5E 00	8.7E-01 3.9E-01	2.7E-03 1.2E-03	1.0E-03 4.6E-04	3.0E-02 LTR 1.4E-01 GAL
2,4-D ACID (PURE)	1.7E 04 3.7E 04	1.0E 04 4.1E 04	2.0E 04 4.4E 04	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	6.8E-02 3.1E-02	6.4E-03 2.9E-03	9.0E-01 KG 4.1E-01 LB
2,4-D ACID (=ETTABLE)	1.7E 04 3.7E 04	1.0E 04 4.1E 04	2.0E 04 4.4E 04	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.4E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.1E-01 4.9E-02	8.8E-03 4.0E-03	1.4E 00 KG 6.5E-01 LB
2,4-D ESTERS (PURE)	2.2E 04 4.9E 04	1.0E 04 4.1E 04	2.7E 04 5.9E 04	2.3E 02 KG 5.0E 02 LB	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.9E-01	6.8E-02 3.1E-02	4.8E-03 2.2E-03	9.0E-01 KG 4.1E-01 LB
2,4-D ESTERS (=ETTABLE)	2.2E 04 4.9E 04	1.0E 04 4.1E 04	2.7E 04 5.9E 04	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.1E-01 4.9E-02	6.6E-03 3.0E-03	1.4E 00 KG 6.5E-01 LB
DALAPON	7.8E 03 6.1E 03	1.0E 04 4.1E 04	3.4E 03 7.4E 03	2.3E 02 KG 5.0E 02 LB	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	1.0E-01 8.8E-02	5.3E-02 2.4E-02	2.3E 00 KG 1.1E 00 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
DDT (PURE)	8.3E 01 1.8E 02	1.7E 03 3.7E 03	1.0E 02 2.2E 02	2.3E 01 KG 5.0E 01 LB	8.0E 10 4.0E 10	1.2E 01 5.3E 00	6.4E-01 3.0E-01	3.7E 00 1.7E 00	5.1E 00 2.3E 00	5.1E 01 KG 2.3E 01 LB
DDT (WETTABLE)	4.3E 01 1.0E 02	1.7E 03 3.7E 03	1.0E 02 2.2E 02	2.3E 01 KG 5.0E 01 LB	1.0E 11 8.0E 10	2.4E 01 1.1E 01	1.7E 00 7.6E-01	4.0E 00 1.8E 00	4.7E 00 2.1E 00	5.5E 01 KG 2.5E 01 LB
DIAZINON (PURE)	6.1E 01 1.3E 02	1.7E 03 3.7E 03	7.4E 01 1.6E 02	2.3E 01 KG 5.0E 01 LB	1.5E 11 6.0E 10	2.0E 01 9.1E 00	1.4E 00 6.5E-01	7.5E-01 3.4E-01	1.7E 00 7.9E-01	1.0E 01 KG 4.7E 00 LB
DIAZINON (WETTABLE)	6.1E 01 1.3E 02	1.7E 03 3.7E 03	7.4E 01 1.6E 02	2.3E 01 KG 5.0E 01 LB	1.0E 11 8.0E 10	2.4E 01 1.1E 01	1.7E 00 7.6E-01	1.2E 00 5.4E-01	2.0E 00 1.1E 00	1.0E 01 KG 7.4E 00 LB
DICAMBA	1.1E 05 2.4E 05	1.0E 05 4.1E 05	1.3E 05 3.0E 05	2.3E 03 KG 5.0E 03 LB	1.3E 11 6.0E 10	1.0E 01 8.0E 00	1.3E 00 5.7E-01	1.0E-02 8.0E-03	2.0E-03 1.1E-03	2.3E-01 KG 1.1E-01 LB
DICHLOBENIL (PURE)	4.1E 04 9.0E 04	1.0E 04 4.1E 04	6.9E 04 1.1E 05	2.3E 02 KG 5.0E 02 LB	9.0E 00 4.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	1.5E-01 6.0E-02	4.0E-03 2.2E-03	2.0E 00 KG 9.0E-01 LB
DICHLOBENIL (WETTABLE)	4.1E 04 9.0E 04	1.0E 04 4.1E 04	6.9E 04 1.1E 05	2.3E 02 KG 5.0E 02 LB	1.5E 01 7.0E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E-01 8.0E-02	6.0E-03 3.0E-03	8.3E 00 KG 1.1E 00 LB
DICHLONE (PURE)	1.1E 02 2.4E 02	1.7E 03 3.7E 03	1.3E 02 3.0E 02	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	1.0E 00 7.5E-01	1.0E 00 8.0E-01	2.3E 01 KG 1.0E 01 LB
DICHLONE (WETTABLE)	1.1E 02 2.4E 02	1.7E 03 3.7E 03	1.3E 02 3.0E 02	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.3E-01	1.9E 00 8.0E-01	2.0E 00 1.1E 00	2.7E 01 KG 1.2E 01 LB
DICHLORVOS	1.1E 03 2.4E 03	1.7E 03 3.7E 03	1.3E 03 2.9E 03	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.9E 00 8.0E-01	2.5E-01 1.1E-01	2.7E 01 KG 1.2E 01 LB
DIELDRIN (PURE)	1.0E 02 3.1E 02	1.7E 03 3.7E 03	1.7E 02 3.7E 02	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	3.7E 00 1.7E 00	1.0E 00 6.0E-01	5.1E 01 KG 2.3E 01 LB
DIELDRIN (WETTABLE)	1.0E 02 3.1E 02	1.7E 03 3.7E 03	1.7E 02 3.7E 02	2.3E 01 KG 5.0E 01 LB	1.0E 01 8.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	4.0E 00 1.8E 00	1.9E 00 8.0E-01	5.5E 01 KG 2.5E 01 LB
DIETHYLAMINE	2.0E 05 5.0E 05	1.0E 05 4.1E 05	2.9E 05 6.3E 05	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.0E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	5.0E-03 2.5E-03	9.1E-04 4.1E-04	7.2E-02 KG 3.3E-02 LB
DIMETHYLAMINE	2.0E 05 6.1E 05	1.0E 05 4.1E 05	3.0E 05 7.0E 05	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.2E 00 5.4E-01	5.4E-03 2.5E-03	7.7E-04 3.5E-04	7.2E-02 KG 3.3E-02 LB
DINITROPHENOL	9.7E 04 2.1E 05	1.0E 04 4.1E 04	1.2E 05 2.6E 05	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	1.1E-01 6.9E-02	1.5E-03 6.9E-04	1.4E 00 KG 6.5E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
DIQUAT	2.4E 05 6.1E 04	1.4E 04 4.1E 04	3.4E 04 7.4E 04	2.3E 02 KG 5.4E 02 LB	1.5E 01 7.3E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.0E-01 8.8E-02	5.3E-03 2.4E-03	2.3E 00 KG 1.1E 00 LB
DISULFOTON (PURE)	1.8E 02 3.9E 02	1.7E 03 3.7E 03	2.1E 02 4.7E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.1E 00	1.4E 00 6.5E-01	1.6E 00 7.5E-01	6.0E-01 2.7E-01	2.3E 01 KG 1.0E 01 LB
DISULFOTON (WETTABLE)	1.8E 02 3.9E 02	1.7E 03 3.7E 03	2.1E 02 4.7E 02	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.9E 00 8.8E-01	8.2E-01 3.7E-01	2.7E 01 KG 1.2E 01 LB
DIURON (PURE)	5.4E 03 1.1E 04	1.8E 04 4.1E 04	6.4E 03 1.3E 04	2.3E 02 KG 5.0E 02 LB	1.6E 01 6.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.5E-01 6.8E-02	3.9E-02 1.8E-02	2.2E 00 KG 9.9E-01 LB
DIURON (WETTABLE)	5.2E 03 1.1E 04	1.8E 04 4.1E 04	6.0E 03 1.3E 04	2.3E 02 KG 5.0E 02 LB	1.6E 01 7.2E 00	2.1E 01 9.6E 00	1.5E 00 6.9E-01	1.8E-01 8.0E-02	5.4E-02 2.4E-02	2.3E 00 KG 1.1E 00 LB
DODECYLBENZENE SULFONIC ACID	2.3E 04 5.3E 04	1.0E 04 4.1E 04	5.0E 04 6.6E 04	2.3E 02 KG 5.2E 02 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.1E-01 4.9E-02	5.9E-03 2.7E-03	1.0E 00 KG 6.5E-01 LB
DUNSBAN (PURE)	1.1E 02 2.3E 02	1.7E 03 3.7E 03	1.3E 02 3.0E 02	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.6E 00 7.5E-01	9.6E-01 4.4E-01	2.3E 01 KG 1.0E 01 LB
DUNSBAN (WETTABLE)	1.1E 02 2.3E 02	1.7E 03 3.7E 03	1.3E 02 3.0E 02	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.4E 00	2.2E 01 9.9E 00	1.6E 00 7.1E-01	1.9E 00 8.8E-01	1.3E 00 6.0E-01	2.7E 01 KG 1.2E 01 LB
ENDOSULFAN (PURE)	2.8E 01 6.1E 01	1.7E 03 3.7E 03	3.4E 01 7.4E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.7E 00	2.0E 01 8.9E 00	1.4E 00 6.3E-01	1.6E 00 7.5E-01	3.8E 00 1.7E 00	2.3E 01 KG 1.0E 01 LB
ENDOSULFAN (WETTABLE	2.8E 01 6.1E 01	1.7E 03 3.7E 03	3.4E 01 7.4E 01	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.5E 00	2.2E 01 1.0E 01	1.6E 00 7.1E-01	1.9E 00 8.9E-01	5.3E 00 2.4E 00	2.7E 01 KG 1.2E 01 LB
ENDRIN (PURE)	8.6E 00 1.9E 01	1.7E 03 3.7E 03	1.0E 01 2.3E 01	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	3.7E 00 1.7E 00	2.3E 01 1.0E 01	5.1E 01 KG 2.3E 01 LB
ENDRIN (WETTABLE)	8.6E 00 1.9E 01	1.7E 03 3.7E 03	1.0E 01 2.3E 01	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	4.0E 00 1.8E 00	3.1E 01 1.4E 01	5.5E 01 KG 2.5E 01 LB
ETHION (PURE)	3.6E 02 7.9E 02	1.7E 03 3.7E 03	4.4E 02 9.6E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.6E 00 7.5E-01	3.0E-01 1.3E-01	2.3E 01 KG 1.0E 01 LB
ETHION (WETTABLE)	3.6E 02 7.9E 02	1.7E 03 3.7E 03	4.4E 02 9.6E 02	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.3E 00	2.1E 01 9.7E 00	1.5E 00 6.9E-01	1.9E 00 8.8E-01	4.1E-01 1.8E-01	2.7E 01 KG 1.2E 01 LB
ETHYLBENZENE	8.3E 04 1.8E 05	1.8E 05 4.1E 05	9.7E 04 2.1E 05	2.1E 03 LTR 5.3E 02 GAL	8.8E 00 6.8E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	5.4E-03 2.5E-03	2.9E-03 1.3E-03	7.2E-02 LTR 2.7E-01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ETHYLENEDIAMINE	3.9E 04 8.6E 04	1.0E 05 2.1E 05	8.7E 04 1.9E 05	2.1E 03 LTR 5.5E 02 GAL	1.4E 01 3.3E 01	1.0E 01 2.3E 00	1.3E 00 6.0E-01	8.1E-03 3.7E-03	6.4E-05 2.9E-03	1.1E-01 LTR 4.1E-01 GAL
EDTA	1.4E 06 3.1E 06	1.0E 06 2.2E 06	1.7E 06 3.7E 06	1.5E 04 LTR 4.0E 03 GAL	8.8E 01 2.3E 02	1.2E 01 2.9E 00	8.4E-01 1.9E-01	2.7E-03 1.2E-03	1.8E-04 8.0E-05	9.8E-02 LTR 1.4E-01 GAL
FERRIC AMMONIUM CITRATE	1.3E 05 2.9E 05	1.4E 05 3.1E 05	1.0E 05 3.9E 05	2.3E 03 KG 5.2E 03 LB	1.2E 01 5.5E 01	1.6E 01 7.3E 00	1.2E 00 5.2E-01	1.8E-02 8.0E-03	1.8E-03 8.7E-04	2.3E-01 KG 1.1E-01 LB
FERRIC CHLORIDE	1.1E 05 2.4E 05	1.4E 05 3.1E 05	1.3E 05 2.9E 05	2.3E 03 KG 5.2E 03 LB	1.4E 01 6.3E 01	1.9E 01 8.3E 00	1.3E 00 6.2E-01	1.8E-02 8.0E-03	1.3E-03 5.7E-04	2.3E-01 KG 1.1E-01 LB
FERRIC FLUORIDE	7.8E 04 1.7E 05	1.0E 05 2.1E 05	9.4E 04 2.1E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 01	1.0E 01 8.2E 00	1.3E 00 5.9E-01	1.0E-02 8.0E-03	1.0E-03 8.0E-04	2.3E-01 KG 1.1E-01 LB
FERRIC NITRATE	1.7E 05 3.7E 05	1.0E 05 2.1E 05	2.0E 05 4.0E 05	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.0E 01	1.0E 01 8.9E 00	1.3E 00 5.7E-01	1.8E-02 8.9E-03	8.7E-04 3.7E-04	2.3E-01 KG 1.1E-01 LB
FERRIC PHOSPHATE	7.8E 04 1.7E 05	1.0E 05 2.1E 05	9.0E 04 2.1E 05	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 01	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.5E-02 6.8E-03	1.4E-03 6.2E-04	2.0E-01 KG 9.0E-02 LB
FERRIC SULFATE	1.1E 05 2.4E 05	1.0E 05 2.1E 05	1.3E 05 3.0E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 01	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.8E-02 8.0E-03	1.2E-03 5.0E-04	2.3E-01 KG 1.1E-01 LB
FERROUS AMMONIUM SULFATE	1.1E 05 2.4E 05	1.0E 05 2.1E 05	1.3E 05 3.0E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 01	1.9E 01 8.4E 00	1.3E 00 6.2E-01	1.8E-02 8.2E-03	1.2E-03 5.0E-04	2.3E-01 KG 1.1E-01 LB
FERROUS CHLORIDE	7.8E 04 1.7E 05	1.0E 05 2.1E 05	9.4E 04 2.1E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.5E 01	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.8E-02 8.0E-03	1.8E-03 8.0E-04	2.3E-01 KG 1.1E-01 LB
FERROUS OXALATE	7.2E 04 1.6E 05	1.0E 05 2.1E 05	8.7E 04 1.9E 05	2.3E 03 KG 5.2E 03 LB	1.2E 01 5.5E 01	1.6E 01 7.0E 00	1.2E 00 5.3E-01	1.5E-02 6.8E-03	1.5E-03 6.7E-04	2.0E-01 KG 9.0E-02 LB
FERROUS SULFATE	1.1E 05 2.4E 05	1.0E 05 2.1E 05	1.3E 05 3.0E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 01	1.4E 01 8.5E 00	1.3E 00 6.2E-01	1.8E-02 8.2E-03	1.2E-03 5.0E-04	2.3E-01 KG 1.1E-01 LB
FORMALDEHYDE	4.2E 05 1.3E 06	1.2E 06 2.2E 06	7.2E 05 1.6E 06	1.5E 04 LTR 4.0E 03 GAL	9.2E 01 4.2E 02	1.2E 01 5.4E 00	8.7E-01 4.0E-01	1.5E-03 6.8E-04	4.2E-04 1.9E-04	2.0E-02 LTR 7.5E-02 GAL
FORMIC ACID	2.4E 05 5.2E 05	1.0E 05 2.1E 05	2.9E 05 6.3E 05	2.1E 03 LTR 5.5E 02 GAL	1.1E 01 5.1E 01	1.5E 01 6.8E 00	1.1E 00 4.9E-01	8.1E-03 3.7E-03	1.1E-03 4.8E-04	1.1E-01 LTR 4.1E-01 GAL
FUMARIC ACID	3.0E 05 8.4E 05	1.0E 06 2.2E 06	4.4E 05 1.0E 06	1.5E 04 LTR 4.0E 03 GAL	9.7E 01 4.4E 02	1.3E 01 5.9E 00	9.2E-01 4.2E-01	2.0E-03 9.0E-04	3.0E-04 1.7E-04	2.0E-02 LTR 1.0E-01 GAL

SUMMARY OF HARMIUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PHOSPHORAL	6.7E 04 1.5E 05	1.0E 05 4.1E 05	8.0E 04 1.9E 05	2.1E 03 LTR 5.5E 02 GAL	1.3E 0 5.0E 0	1.7E 01 7.0E 00	1.2E 00 5.5E-01	8.1E+03 3.7E+03	2.2E+03 1.0E+03	1.1E+01 LTR 4.1E+01 GAL
DITHION (PURE)	2.0E 01 4.1E 01	1.7E 03 3.7E 03	3.4E 01 7.4E 01	2.3E 01 KG 5.0E 01 LB	1.5E 0. 3.3E 0.	2.0E 01 9.2E 00	1.5E 00 6.6E-01	1.6E 00 7.5E-01	5.8E 00 1.7E 00	2.3E 01 KG 1.0E 01 LB
DITHION (WETTABLE)	2.0E 01 4.1E 01	1.7E 03 3.7E 03	3.4E 01 7.4E 01	2.3E 01 KG 5.0E 01 LB	1.6E 0 7.3E 0.	2.2E 01 9.0E 00	1.5E 00 7.0E-01	1.9E 00 8.8E-01	5.3E 00 2.4E 00	2.7E 01 KG 1.2E 01 LB
HEPTACHLOR (PURE)	1.9E 03 4.1E 03	1.7E 03 3.7E 03	2.3E 03 5.2E 03	2.3E 01 KG 5.0E 01 LB	8.0E 01 4.4E 0.	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.7E 00 1.7E 00	1.2E-01 6.6E-02	5.1E 01 KG 2.3E 01 LB
HEPTACHLOR (WETTABLE)	1.9E 03 4.1E 03	1.7E 03 3.7E 03	2.3E 03 5.2E 03	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.6E 0.	2.2E 01 1.0E 01	1.6E 00 7.3E-01	4.0E 00 1.8E 00	1.4E-01 6.3E-02	5.9E 01 KG 2.9E 01 LB
HYDROCHLORIC ACID	6.0E 05 1.3E 06	1.2E 06 2.6E 06	7.2E 05 1.6E 06	1.5E 04 LTR 4.0E 03 GAL	9.0E 01 4.3E 00	1.3E 01 5.7E 00	9.4E-01 4.1E-01	2.0E-03 9.0E-04	2.5E-04 1.1E-04	2.0E-02 LTR 1.0E-01 GAL
HYDROFLUORIC ACID	3.3E 05 7.3E 05	1.0E 06 2.2E 06	4.0E 05 8.9E 05	1.5E 04 LTR 6.0E 03 GAL	1.1E 01 4.9E 00	1.4E 01 6.5E 00	1.0E 00 4.6E-01	1.5E-03 6.8E-04	7.5E-04 3.4E-04	2.0E-02 LTR 7.5E-02 GAL
HYDROGEN CYANIDE	2.0E 02 4.1E 02	1.7E 03 3.7E 03	3.4E 02 7.4E 02	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	8.9E-01 4.1E-01	7.7E-01 3.5E-01	1.2E 01 KG 5.6E 00 LB
HYDROQUINONE	1.0E 04 2.1E 04	1.0E 04 4.1E 04	1.7E 04 3.7E 04	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	1.1E-01 4.9E-02	1.1E-02 4.8E-03	1.0E 00 KG 4.5E-01 LB
HYDROXYLAMINE	4.2E 05 9.2E 05	1.0E 06 2.2E 06	5.0E 05 1.1E 06	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 5.1E 00	1.5E 01 6.8E 00	1.1E 00 4.8E-01	1.5E-03 6.8E-04	3.5E-04 1.6E-04	2.0E-02 LTR 7.5E-02 GAL
ISOPRENE	2.1E 05 4.6E 05	1.0E 05 4.1E 05	2.5E 05 5.5E 05	2.1E 03 LTR 5.5E 02 GAL	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	2.7E-03 1.2E-03	4.0E-04 1.9E-04	5.0E-02 LTR 1.0E-01 GAL
ISOPROPANOLAMINE DODECYLBENZENE SULFONATE	3.3E 04 7.3E 04	1.0E 05 4.1E 05	4.0E 04 8.9E 04	2.3E 01 KG 5.0E 01 LB	2.0E-01 4.4E-01	2.8E-01 2.8E-01	2.0E-01 2.0E-01	1.1E-02 4.9E-03	4.0E-03 2.0E-03	1.0E-01 KG 0.5E-02 LB
KELTHANE (PURE)	2.0E 05 4.1E 05	1.0E 05 4.1E 05	3.4E 05 7.4E 05	2.3E 01 KG 5.0E 01 LB	1.1E 01 5.0E 00	1.5E 01 6.6E 00	1.0E 00 4.7E-01	4.1E-03 1.8E-03	7.1E-04 3.2E-04	5.0E-02 KG 2.0E-02 LB
KELTHANE (WETTABLE)	2.0E 05 4.1E 05	1.0E 05 4.1E 05	3.4E 05 7.4E 05	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.8E 00	1.2E 00 5.6E-01	8.1E-03 3.7E-03	9.7E-04 4.4E-04	1.1E-01 KG 0.9E-02 LB
LEAD ACETATE	1.2E 04 2.6E 04	1.7E 03 3.7E 03	1.4E 04 3.2E 04	2.3E 01 KG 5.0E 01 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	2.1E 00 9.5E-01	2.1E-04 9.6E-05	2.9E 01 KG 1.3E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
LEAD BROMIDE	1.2E 04 2.5E 04	1.7E 03 3.7E 03	1.4E 04 3.1E 04	2.3E 01 KG 5.0E 01 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	2.1E 00 9.5E-01	2.2E-04 9.8E-05	2.9E 01 KG 1.3E 01 LB
LEAD CHLORIDE	8.7E 03 1.9E 04	1.7E 03 3.7E 03	1.1E 04 2.3E 04	2.3E 01 KG 5.0E 01 LB	9.2E 00 4.2E 00	1.2E 01 5.6E 00	8.7E-01 4.0E-01	2.1E 00 9.5E-01	2.9E-04 1.3E-04	2.9E 01 KG 1.3E 01 LB
LEAD FLUOBORATE	1.2E 04 2.6E 04	1.7E 03 3.7E 03	1.4E 04 3.2E 04	2.3E 01 KG 5.0E 01 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	2.1E 00 9.5E-01	2.1E-04 9.5E-05	2.9E 01 KG 1.3E 01 LB
LEAD FLUORIDE	7.7E 03 1.7E 04	1.7E 03 3.7E 03	9.3E 03 2.1E 04	2.3E 01 KG 5.0E 01 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	2.1E 00 9.5E-01	2.5E-04 1.2E-04	2.9E 01 KG 1.3E 01 LB
LEAD IODIDE	1.4E 04 3.2E 04	1.7E 03 3.7E 03	1.4E 04 3.0E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.1E 00 9.5E-01	1.4E-04 6.1E-05	2.9E 01 KG 1.3E 01 LB
LEAD NITRATE	1.0E 04 2.3E 04	1.7E 03 3.7E 03	1.3E 04 2.8E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.1E 00 9.5E-01	2.4E-04 1.1E-04	2.9E 01 KG 1.3E 01 LB
LEAD STEARATE	2.4E 04 5.4E 04	1.7E 03 3.7E 03	2.9E 04 6.5E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.1E 00 9.5E-01	1.8E-04 8.7E-05	2.9E 01 KG 1.3E 01 LB
LEAD SULFATE	9.9E 03 2.1E 04	1.7E 03 3.7E 03	1.2E 04 2.5E 04	2.3E 01 KG 5.0E 01 LB	8.9E 00 4.0E 00	1.2E 01 5.4E 00	8.5E-01 3.9E-01	2.1E 00 9.5E-01	2.1E-04 9.3E-05	2.9E 01 KG 1.3E 01 LB
LEAD SULFIDE	7.9E 03 1.7E 04	1.7E 03 3.7E 03	9.1E 03 2.0E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.1E 00 9.5E-01	2.0E-04 1.0E-04	2.9E 01 KG 1.3E 01 LB
LEAD TETRA-ACETATE	1.0E 04 3.1E 04	1.7E 03 3.7E 03	1.7E 04 3.7E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.1E 00 9.5E-01	1.8E-04 8.2E-05	2.9E 01 KG 1.3E 01 LB
LEAD THIOCYANATE	1.4E 04 2.2E 04	1.7E 03 3.7E 03	1.2E 04 2.7E 04	2.3E 01 KG 5.0E 01 LB	8.9E 00 4.0E 00	1.2E 01 5.4E 00	8.5E-01 3.9E-01	2.1E 00 9.5E-01	1.9E-04 8.8E-05	2.9E 01 KG 1.3E 01 LB
LEAD THIOSULFATE	1.0E 04 2.2E 04	1.7E 03 3.7E 03	1.2E 04 2.7E 04	2.3E 01 KG 5.0E 01 LB	8.9E 00 4.0E 00	1.2E 01 5.4E 00	8.5E-01 3.9E-01	2.1E 00 9.5E-01	2.0E-04 8.9E-05	2.9E 01 KG 1.3E 01 LB
LEAD TUNGSTATE	1.4E 04 3.1E 04	1.7E 03 3.7E 03	1.7E 04 3.8E 04	2.3E 01 KG 5.0E 01 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.1E 00 9.5E-01	1.4E-04 6.2E-05	2.9E 01 KG 1.3E 01 LB
LINDANE (PURE)	1.2E 03 2.7E 03	1.7E 03 3.7E 03	1.2E 03 2.7E 03	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.3E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	3.7E 00 1.7E 00	2.0E-01 8.9E-02	5.1E 01 KG 2.3E 01 LB
LINDANE (WETTABLE)	1.2E 03 2.7E 03	1.7E 03 3.7E 03	1.2E 03 2.7E 03	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.4E-01	4.9E 00 2.2E 00	2.7E-01 1.2E-01	6.8E 01 KG 3.1E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
LITHIUM DICHROMATE	3.7E 05 8.1E 05	1.0E 06 2.2E 06	4.5E 05 9.8E 05	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.7E 00	1.7E 01 7.5E 00	1.3E 00 5.4E-01	3.2E-03 1.5E-03	5.2E-04 2.4E-04	4.5E-02 KG 1.9E-02 LB
LITHIUM CHROMATE	4.0E 05 1.0E 06	1.0E 06 2.2E 06	5.4E 05 1.2E 06	1.5E 04 KG 3.2E 04 LB	1.8E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	3.2E-03 1.5E-03	4.2E-04 1.9E-04	4.5E-02 KG 1.9E-02 LB
LITHIUM FLUORIDE	9.2E 05 1.1E 06	1.0E 06 2.2E 06	6.2E 05 1.4E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 4.8E 00	1.4E 01 6.4E 00	1.0E 00 4.6E-01	3.2E-03 1.5E-03	2.8E-04 1.3E-04	4.5E-02 KG 1.9E-02 LB
MALATHION (PURE)	9.2E 01 2.0E 02	1.7E 03 3.7E 03	1.1E 02 2.4E 02	1.9E 01 LTR 5.0E 00 GAL	1.6E 01 7.2E 00	2.1E 01 9.6E 00	1.5E 00 6.9E-01	1.6E 00 7.5E-01	1.2E 00 5.3E-01	2.5E 01 LTR 6.6E 01 GAL
MALATHION (EMULSIFIABLE)	9.2E 01 2.0E 02	1.7E 03 3.7E 03	1.1E 02 2.4E 02	1.9E 01 LTR 5.0E 00 GAL	1.7E 01 7.6E 00	2.2E 01 1.0E 01	1.6E 00 7.3E-01	1.9E 00 8.8E-01	1.6E 00 7.3E-01	2.7E 01 LTR 1.0E 02 GAL
MALEIC ACID	3.9E 05 8.4E 05	1.0E 06 2.2E 06	4.6E 05 1.0E 06	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	2.0E-03 9.0E-04	3.9E-04 1.7E-04	2.4E-02 KG 1.7E-02 LB
MALEIC ANHYDRIDE	3.2E 05 7.2E 05	1.0E 06 2.2E 06	3.9E 05 8.6E 05	1.5E 04 KG 3.2E 04 LB	1.2E 01 4.6E 00	1.5E 01 6.1E 00	9.6E-01 4.4E-01	1.5E-03 6.8E-04	6.0E-04 3.0E-04	2.8E-02 KG 9.4E-03 LB
MERCURIC ACETATE	4.9E 02 2.0E 03	1.7E 03 3.7E 03	1.1E 03 2.4E 03	2.3E 01 KG 5.2E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.3E-01	3.7E 00 1.7E 00	2.8E-01 1.3E-01	5.1E 01 KG 2.3E 01 LB
MERCURIC CHLORIDE	7.4E 02 1.7E 03	1.7E 03 3.7E 03	9.4E 02 2.1E 03	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.6E 00	2.2E 01 1.0E 01	1.6E 00 7.3E-01	3.7E 00 1.7E 00	3.2E-01 1.5E-01	5.1E 01 KG 2.3E 01 LB
MERCURIC NITRATE	9.4E 02 2.1E 03	1.7E 03 3.7E 03	1.1E 03 2.5E 03	2.3E 01 KG 5.0E 01 LB	1.7E 01 7.7E 00	2.3E 01 1.0E 01	1.6E 00 7.3E-01	3.7E 00 1.7E 00	2.7E-01 1.2E-01	5.1E 01 KG 2.3E 01 LB
MERCURIC OXIDE	6.1E 02 1.3E 03	1.7E 03 3.7E 03	7.0E 02 1.6E 03	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	3.7E 00 1.7E 00	3.2E-01 1.5E-01	5.1E 01 KG 2.3E 01 LB
MERCURIC SULFATE	8.4E 02 1.9E 03	1.7E 03 3.7E 03	1.0E 03 2.3E 03	2.3E 01 KG 5.0E 01 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.1E-01	3.7E 00 1.7E 00	2.9E-01 1.3E-01	5.1E 01 KG 2.3E 01 LB
MERCURIC THIOCYANATE	9.2E 02 2.0E 03	1.7E 03 3.7E 03	1.1E 03 2.4E 03	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.3E 00	2.2E 01 9.8E 00	1.5E 00 7.0E-01	3.7E 00 1.7E 00	2.1E-01 9.7E-02	5.1E 01 KG 2.3E 01 LB
MERCUROUS NITRATE	8.9E 02 1.9E 03	1.7E 03 3.7E 03	9.7E 02 2.1E 03	2.3E 01 KG 5.0E 01 LB	8.8E 00 8.8E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.7E 00 1.7E 00	3.1E-01 1.4E-01	5.1E 01 KG 2.3E 01 LB
METHOXYCHLOR (PURE)	2.2E 02 4.9E 02	1.7E 03 3.7E 03	2.7E 02 5.9E 02	1.9E 01 LTR 5.0E 00 GAL	9.7E 00 4.4E 00	1.3E 01 5.9E 00	9.2E-01 4.2E-01	1.6E 00 7.5E-01	8.8E-01 4.0E-01	2.3E 01 LTR 8.6E 01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
METHOXYCHLOR (-ETTABLE)	2.2E 02 4.9E 02	1.7E 03 3.7E 03	2.7E 02 5.9E 02	1.9E 01 LTH 5.0E 00 GAL	1.8E 01 4.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.9E 00 8.4E-01	1.2E 00 5.5E-01	2.7E 01 LTR 1.0E 02 GAL
METHYL MERCAPTAN	2.0E 03 4.1E 03	1.0E 04 4.1E 04	3.4E 03 7.4E 03	2.3E 02 KG 5.2E 02 LB	1.5E 01 3.9E 00	2.2E 01 9.2E 00	1.5E 00 6.6E-01	8.1E-02 3.7E-02	3.1E-02 1.4E-02	1.1E 00 KG 4.9E-01 LB
METHYL METHACRYLATE	6.9E 05 1.5E 06	1.7E 06 2.2E 06	8.4E 05 1.8E 06	1.9E 04 LTH 4.2E 03 GAL	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.6E-01 4.1E-01	5.0E-04 2.3E-04	1.3E-04 5.7E-05	4.4E-03 LTR 2.5E-02 GAL
METHYL PARATHION (PURE)	8.3E 00 1.8E 01	1.7E 03 3.7E 03	1.0E 01 2.2E 01	1.9E 01 LTH 5.2E 00 GAL	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	7.5E-01 3.4E-01	1.3E 01 5.8E 00	1.9E 01 LTR 3.9E 01 GAL
METHYL PARATHION (-ETTABLE)	4.3E 00 1.0E 01	1.7E 03 3.7E 03	1.0E 01 2.2E 01	1.9E 01 LTH 5.2E 00 GAL	1.3E 01 6.1E 00	1.8E 01 8.2E 00	1.3E 00 5.8E-01	1.2E 00 5.4E-01	1.4E 01 8.2E 00	1.6E 01 LTR 6.2E 01 GAL
MEVINPHOS	1.1E 02 2.4E 02	1.7E 03 3.7E 03	1.3E 02 3.0E 02	1.9E 01 LTH 5.0E 00 GAL	1.3E 01 5.8E 00	1.7E 01 7.8E 00	1.2E 00 5.3E-01	1.2E 00 5.4E-01	2.2E 00 1.0E 00	1.6E 01 LTR 6.2E 01 GAL
MOLYBDIC TRIOXIDE	1.0E 06 2.3E 06	1.0E 06 2.0E 06	1.2E 06 2.7E 06	1.5E 04 KG 3.2E 04 LB	9.5E 00 4.3E 00	1.3E 01 5.8E 00	9.1E-01 4.1E-01	3.2E-03 1.5E-03	1.4E-04 6.5E-05	4.3E-02 KG 1.9E-02 LB
MONOETHYLAMINE	1.1E 05 2.4E 05	1.0E 04 4.1E 04	1.3E 05 3.0E 05	2.1E 02 LTH 5.5E 01 GAL	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	5.4E-02 2.5E-02	2.2E-03 1.0E-03	7.2E-01 LTR 2.7E 00 GAL
MONOMETHYLAMINE	8.3E 04 1.8E 05	1.0E 04 4.1E 04	1.0E 05 2.2E 05	2.1E 02 LTH 5.5E 01 GAL	1.3E 01 6.0E 00	1.9E 01 8.3E 00	1.3E 00 5.7E-01	5.4E-02 2.5E-02	2.6E-03 1.2E-03	7.2E-01 LTR 2.7E 00 GAL
NALED	5.2E 02 1.1E 03	1.7E 03 3.7E 03	6.9E 02 1.5E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	7.5E-01 3.4E-01	2.1E-01 9.7E-02	1.7E 01 KG 6.7E 00 LB
NAPHTHALENE	5.4E 03 1.1E 04	1.7E 03 3.7E 03	4.2E 03 1.3E 04	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.8E 01 8.3E 00	1.3E 00 5.9E-01	1.8E 00 8.4E-01	5.9E-02 1.8E-02	2.5E 01 KG 1.7E 01 LB
NAPHTHENIC ACID	2.2E 04 4.5E 04	1.7E 03 3.7E 03	2.4E 04 5.2E 04	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.6E 00	1.9E 01 8.0E 00	1.4E 00 6.3E-01	2.0E 00 9.1E-01	1.4E-02 6.2E-03	2.7E 01 KG 1.2E 01 LB
NICKEL ACETATE	1.9E 06 3.2E 06	1.0E 06 2.2E 06	1.0E 06 3.9E 06	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.2E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	9.5E-05 4.2E-05	4.3E-02 KG 1.9E-02 LB
NICKEL AMMONIUM SULFATE	2.3E 06 5.1E 06	1.0E 06 2.2E 06	2.0E 06 6.2E 06	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	5.9E-05 2.7E-05	4.3E-02 KG 1.9E-02 LB
NICKEL BROMIDE	1.4E 06 3.5E 06	1.2E 06 2.2E 06	1.9E 06 4.3E 06	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.2E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	8.5E-05 3.9E-05	4.3E-02 KG 1.9E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (K -LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
NICKEL CHLORIDE	1.4E 06 9.1E 06	1.4E 06 2.2E 06	1.7E 06 3.7E 06	1.5E 04 KG 3.2E 04 LB	9.8E 00 6.8E 00	1.2E 01 9.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	9.8E-05 6.6E-05	6.3E-02 KG 1.9E-02 LB
NICKEL FORMATE	1.1E 06 2.4E 06	1.7E 06 2.2E 06	1.3E 06 2.9E 06	1.5E 04 KG 3.2E 04 LB	9.7E 00 6.6E 00	1.3E 01 9.9E 00	9.2E-01 6.2E-01	3.2E-03 1.5E-03	1.3E-04 5.7E-05	8.3E-02 KG 1.9E-02 LB
NICKEL HYDROXIDE	5.5E 05 1.2E 06	1.8E 06 2.2E 06	6.6E 05 1.5E 06	1.5E 04 KG 3.2E 04 LB	8.8E 00 6.2E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.7E-03 1.2E-03	2.8E-04 8.9E-05	3.6E-02 KG 1.6E-02 LB
NICKEL NITRATE	1.7E 06 3.8E 06	4.6E-01 2.8E-01	2.1E 06 4.6E 06	6.3E-38 2KG 1.6E 03 LB	8.8E 00 6.8E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.6E-01 9.8E-01	8.6E-05 3.6E-05	8.3E-01 2KG 8.8E-01 LB
NICKEL SULFATE	1.5E 06 3.4E 06	1.7E 06 2.2E 06	1.9E 06 4.1E 06	1.5E 04 KG 3.2E 04 LB	8.8E 00 6.8E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	8.8E-05 6.8E-05	6.3E-02 KG 1.9E-02 LB
NITRIC ACID	6.4E 05 1.3E 06	1.8E 06 2.2E 06	7.2E 05 1.6E 06	1.5E 04 LTN 6.8E 03 GAL	9.4E 00 6.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	2.9E-03 9.8E-04	8.2E-04 1.9E-04	2.6E-02 LTN 1.9E-01 GAL
NITROBENZENE	6.2E 05 9.2E 05	1.4E 06 2.2E 06	5.4E 05 1.1E 06	1.5E 04 LTN 6.6E 03 GAL	1.1E 01 5.6E 00	1.5E 01 6.7E 00	1.0E 00 4.9E-01	3.2E-03 1.3E-03	6.5E-04 2.9E-04	6.3E-02 LTN 1.1E-01 GAL
NITROGEN DIOXIDE	6.4E 05 9.6E 05	1.4E 06 2.2E 06	5.3E 05 1.2E 06	1.5E 04 KG 3.2E 04 LB	9.4E 00 6.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	2.8E-03 9.9E-04	5.7E-04 2.0E-04	2.6E-02 KG 1.2E-02 LB
NITROPHENOL	1.3E 05 2.4E 05	1.8E 06 4.1E 06	1.0E 05 3.4E 05	2.3E 02 KG 5.0E 02 LB	1.3E 01 6.1E 03	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.9E-01 8.6E-02	2.1E-03 9.5E-04	2.5E 00 KG 1.1E 02 LB
PARAFORMALDEHYDE	8.9E 05 1.5E 06	1.8E 06 2.2E 06	7.2E 05 1.4E 06	1.5E 04 LTN 6.8E 03 GAL	1.8E 01 8.7E 00	1.4E 01 6.3E 00	9.8E-01 4.5E-01	2.8E-03 9.6E-04	2.5E-04 1.1E-04	2.6E-02 LTN 1.9E-01 GAL
PARATHION (PURE)	1.9E 01 4.3E 01	1.7E 03 3.7E 03	2.3E 01 5.2E 01	1.9E 01 LTN 5.9E 00 GAL	1.6E 01 7.5E 00	2.2E 01 1.0E 01	1.6E 00 7.1E-01	1.0E 00 7.5E-01	1.0E 01 4.6E 00	2.3E 01 LTN 8.6E 01 GAL
PARATHION (WETTABLE)	1.9E 01 4.3E 01	1.7E 03 3.7E 03	2.3E 01 5.2E 01	1.9E 01 LTN 5.9E 00 GAL	1.0E 01 4.8E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.9E 00 8.8E-01	1.0E 01 6.3E 00	2.7E 01 LTN 1.9E 02 GAL
PENTACHLOROPHENOL	6.9E 02 1.5E 03	1.7E 03 3.7E 03	8.4E 02 1.8E 03	2.3E 01 KG 5.0E 01 LB	1.6E 01 7.1E 00	2.1E 01 9.5E 00	1.5E 00 6.8E-01	1.8E 00 8.4E-01	2.8E-01 1.3E-01	2.5E 01 KG 1.2E 01 LB
PHENOL	6.5E 04 1.4E 05	1.8E 04 4.1E 04	7.9E 04 1.7E 05	2.3E 02 KG 5.0E 02 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.6E-01	8.1E-02 3.7E-02	2.2E-03 1.0E-03	2.1E 00 KG 6.9E-01 LB
PHOSGENE	8.1E 05 1.8E 06	1.8E 06 2.2E 06	9.8E 05 2.2E 06	1.5E 04 KG 3.2E 04 LB	9.1E 00 6.2E 00	1.2E 01 5.6E 00	8.6E-01 4.0E-01	2.8E-03 9.8E-04	1.8E-04 8.2E-05	2.6E-02 KG 1.2E-02 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PHOSPHORIC ACID	2.4E 04 5.7E 04	1.0E 04 2.2E 04	3.1E 04 6.9E 04	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.8E-03 9.0E-04	9.6E-05 4.4E-05	2.6E-02 KG 1.2E-02 LB
PHOSPHORUS	8.3E 02 1.8E 01	1.7E 03 3.7E 03	1.0E 01 2.2E 01	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.7E 00	2.0E 01 9.2E 00	1.4E 02 6.4E-01	7.5E-01 3.4E-01	1.3E 01 5.8E 00	1.7E 01 KG 4.7E 00 LB
PHOSPHORUS OXYCHLORIDE	8.2E 05 1.8E 06	1.0E 06 2.2E 06	9.9E 05 2.2E 06	1.5E 04 KG 3.2E 04 LB	9.2E 00 4.2E 00	1.2E 01 5.0E 00	8.7E-01 4.0E-01	2.8E-03 9.0E-04	1.0E-04 8.1E-05	2.6E-02 KG 1.2E-02 LB
PHOSPHORUS PENTAFLUORIDE	4.4E 05 9.7E 05	1.0E 06 2.2E 06	5.3E 05 1.2E 06	1.5E 04 KG 3.2E 04 LB	9.6E 00 4.4E 00	1.3E 01 5.8E 00	9.2E-01 4.2E-01	2.8E-03 9.0E-04	4.9E-04 2.2E-04	2.6E-02 KG 1.2E-02 LB
PHOSPHORUS PENTASULFIDE	9.2E 04 2.0E 05	1.0E 05 4.1E 05	1.1E 05 2.4E 05	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.7E 00	1.4E 01 6.2E 00	9.7E-01 4.4E-01	1.1E-02 4.9E-03	1.6E-03 7.3E-04	1.4E-01 KG 6.5E-02 LB
PHOSPHORUS TRICHLORIDE	7.6E 05 1.7E 06	1.0E 06 2.2E 06	9.2E 05 2.0E 06	1.5E 04 KG 3.2E 04 LB	9.3E 00 4.2E 00	1.2E 01 5.7E 00	8.9E-01 4.0E-01	2.8E-03 9.0E-04	1.9E-04 8.8E-05	2.6E-02 KG 1.2E-02 LB
POLYCHLORINATED BIPHENYLS	1.4E 04 3.1E 03	1.7E 03 3.7E 03	1.7E 04 3.7E 04	1.9E 01 LTR 5.0E 00 GAL	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.7E 00 1.7E 00	1.4E-02 6.4E-03	5.1E 01 LTR 2.0E 02 GAL
POTASSIUM ARSENATE	3.4E 04 7.9E 04	1.7E 03 3.7E 03	4.4E 04 9.6E 04	2.3E 01 KG 5.0E 01 LB	1.9E 01 8.8E 00	2.4E 01 1.0E 01	1.4E 00 6.5E-01	2.1E 00 9.5E-01	3.6E-03 1.7E-03	2.9E 01 KG 1.3E 01 LB
POTASSIUM ARSENITE	9.0E 04 2.1E 05	1.7E 03 3.7E 03	1.1E 05 2.5E 05	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	2.1E 00 9.5E-01	1.4E-03 6.6E-04	2.9E 01 KG 1.3E 01 LB
POTASSIUM BICHROMATE	4.1E 05 9.0E 05	1.0E 06 2.2E 06	4.9E 05 1.1E 06	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.4E 00	1.6E 01 7.2E 00	1.1E 00 5.2E-01	3.2E-03 1.5E-03	3.4E-04 1.6E-04	4.3E-02 KG 1.9E-02 LB
POTASSIUM CHROMATE	5.4E 05 1.2E 06	1.0E 06 2.2E 06	6.5E 05 1.4E 06	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	3.2E-03 1.5E-03	2.7E-04 1.2E-04	4.3E-02 KG 1.9E-02 LB
POTASSIUM CYANIDE	6.9E 02 1.5E 03	1.7E 03 3.7E 03	8.4E 02 1.8E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.2E 00 5.4E-01	2.1E-01 9.6E-02	1.6E 01 KG 7.4E 00 LB
POTASSIUM HYDROXIDE	1.5E 05 3.2E 05	1.0E 05 4.1E 05	1.8E 05 3.9E 05	2.3E 03 KG 5.0E 03 LB	1.8E 01 8.0E 00	1.3E 01 6.1E 00	9.6E-01 4.4E-01	1.1E-02 4.9E-03	1.0E-03 4.5E-04	1.6E-01 KG 6.5E-02 LB
POTASSIUM PERMANGANATE	6.4E 03 1.4E 04	1.0E 04 2.1E 04	7.7E 03 1.7E 04	2.5E 02 KG 5.0E 02 LB	1.4E 01 6.5E 00	1.9E 01 8.6E 00	1.4E 00 6.1E-01	1.0E-01 8.0E-02	2.3E-02 1.0E-02	2.3E 00 KG 1.1E 00 LB
PROPIONIC ACID	5.2E 05 1.1E 06	1.0E 06 2.2E 06	6.3E 05 1.4E 06	1.5E 04 LTR 4.0E 03 GAL	1.1E 01 4.9E 00	1.4E 01 6.6E 00	1.0E 00 4.7E-01	1.5E-03 6.0E-04	4.0E-04 2.2E-04	2.0E-02 LTR 7.5E-02 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
PROPIONIC ANHYDRIDE	4.5E 05 1.0E 06	1.2E 06 2.6E 06	5.5E 05 1.2E 06	1.5E 06 KG 3.2E 06 LB	1.1E 01 5.2E 01	1.5E 01 6.9E 00	1.0E 00 4.7E-01	1.5E-03 6.8E-04	5.4E-04 2.5E-04	2.0E-02 KG 9.0E-03 LB
PROPYL ALCOHOL	1.0E 07 2.4E 07	2.8E-01 7.3E-01	1.4E 07 3.1E 07	8.8E-01 LTR 3.3E-01 GAL	8.8E 00 4.2E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	8.8E-01 8.8E-01	2.1E-05 9.7E-06	2.7E-01 LTR 1.0E-01 GAL
PYRETHRINS (PURE)	2.1E 05 4.9E 05	1.4E 05 3.1E 05	2.5E 05 5.5E 05	2.1E 01 LTR 5.5E 02 GAL	8.8E 00 4.0E 01	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.5E-02 6.8E-03	5.2E-04 2.4E-04	2.0E-01 LTR 7.5E-01 GAL
PYRETHRINS (WETTABLE)	2.1E 05 4.5E 05	1.0E 05 4.1E 05	2.5E 05 5.5E 05	2.1E 01 LTR 5.5E 02 GAL	1.3E 01 5.8E 01	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.8E-02 8.0E-03	7.1E-04 3.2E-04	2.3E-01 LTR 8.8E-01 GAL
PYROGALLIC ACID	5.2E 04 1.1E 05	1.8E 04 4.1E 04	6.8E 04 1.3E 05	2.5E 02 KG 5.8E 02 LB	1.3E 01 6.7E 01	2.8E 01 9.8E 00	1.4E 00 6.4E-01	1.9E-01 8.6E-02	5.4E-03 2.4E-03	2.5E 00 KG 1.1E 02 LB
QUINOLINE	1.4E 04 3.1E 04	1.7E 03 3.7E 03	1.7E 04 3.7E 04	1.9E 01 LTR 9.4E 03 GAL	1.3E 01 5.7E 01	1.7E 01 7.4E 00	1.2E 00 5.4E-01	8.9E-01 4.1E-01	1.1E-02 4.8E-03	1.2E 01 LTR 4.7E 01 GAL
RESORCINOL	9.7E 04 2.1E 05	1.8E 04 4.1E 04	1.2E 05 2.6E 05	2.3E 02 KG 5.2E 02 LB	9.8E 00 4.5E 01	1.3E 01 5.9E 00	9.3E-01 4.2E-01	1.1E-01 4.9E-02	1.1E-03 5.0E-04	1.4E 00 KG 6.5E-01 LB
SELENIC ACID	7.2E 04 1.6E 05	1.7E 03 3.7E 03	8.7E 04 1.9E 05	2.3E 01 KG 5.2E 01 LB	1.4E 01 6.5E 01	1.9E 01 8.7E 00	1.4E 00 6.2E-01	2.1E 00 9.5E-01	2.4E-03 9.2E-04	2.9E 01 KG 1.3E 01 LB
SELENIUM OXIDE	3.3E 04 7.3E 04	1.7E 03 3.7E 03	4.2E 04 8.9E 04	2.3E 01 KG 5.2E 01 LB	1.5E 01 6.9E 01	2.0E 01 9.2E 00	1.4E 00 6.6E-01	2.1E 00 9.5E-01	4.4E-03 2.0E-03	2.9E 01 KG 1.3E 01 LB
SEVIN (PURE)	8.3E 03 1.8E 04	1.0E 04 4.1E 04	1.0E 04 2.2E 04	2.3E 02 KG 5.2E 02 LB	1.2E 01 5.3E 01	1.5E 01 7.0E 00	1.1E 00 5.0E-01	1.5E-01 6.8E-02	1.3E-02 5.8E-03	2.2E 00 KG 9.8E-01 LB
SEVIN (WETTABLE)	8.3E 03 1.8E 04	1.0E 04 4.1E 04	1.0E 04 2.2E 04	2.3E 02 KG 5.0E 02 LB	1.2E 01 5.5E 01	1.6E 01 7.3E 00	1.2E 00 5.2E-01	1.8E-01 8.0E-02	1.0E-02 6.4E-03	2.3E 00 KG 1.1E 00 LB
SODIUM	1.1E 05 2.4E 05	1.0E 05 4.1E 05	1.3E 05 2.9E 05	2.3E 03 KG 5.2E 03 LB	1.0E 01 4.6E 00	1.4E 01 6.1E 00	9.7E-01 4.4E-01	8.1E-03 3.7E-03	1.4E-03 6.2E-04	1.1E-01 KG 4.9E-02 LB
SODIUM ARSENATE	7.0E 04 1.7E 05	1.7E 03 3.7E 03	9.4E 04 2.1E 05	2.3E 01 KG 5.2E 01 LB	1.4E 01 6.5E 01	1.9E 01 8.7E 00	1.4E 00 6.2E-01	2.1E 00 9.5E-01	1.9E-03 8.6E-04	2.9E 01 KG 1.3E 01 LB
SODIUM ARSENITE	9.7E 04 2.1E 05	1.7E 03 3.7E 03	1.2E 05 2.6E 05	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.5E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	2.1E 00 9.5E-01	1.5E-03 6.9E-04	2.9E 01 KG 1.3E 01 LB
SODIUM BICHROMATE	4.1E 05 9.1E 05	1.0E 06 2.2E 06	5.0E 05 1.1E 06	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	3.2E-03 1.5E-03	4.7E-04 2.1E-04	4.3E-02 KG 1.9E-02 LB

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SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
SODIUM BIFLUORIDE	6.1E 05 1.4E 06	1.4E 06 2.2E 06	7.4E 05 1.6E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.8E 00	1.5E 01 6.7E 00	1.4E 00 6.0E-01	3.2E-03 1.5E-03	2.4E-04 1.1E-04	4.3E-02 KG 1.9E-02 LB
SODIUM BISULFITE	6.7E 05 1.5E 06	1.4E 06 2.2E 06	8.3E 05 1.8E 06	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.8E 00	1.5E 01 6.7E 00	1.0E 00 4.0E-01	2.0E-03 9.0E-04	2.2E-04 1.0E-04	2.6E-02 KG 1.2E-02 LB
SODIUM CHROMATE	9.5E 05 2.1E 06	1.2E 06 2.2E 06	1.1E 06 2.5E 06	1.5E 04 KG 3.2E 04 LB	1.0E 01 4.6E 00	1.3E 01 6.1E 00	9.0E-01 4.0E-01	3.2E-03 1.5E-03	1.5E-04 7.0E-05	4.3E-02 KG 1.9E-02 LB
SODIUM CYANIDE	5.3E 02 1.2E 03	1.7E 03 3.7E 03	6.4E 02 1.4E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.0E-01	1.2E 00 5.4E-01	3.7E-01 1.7E-01	1.6E 01 KG 7.0E 00 LB
SODIUM DODECYLBENZENE SULFONATE	2.8E 04 6.2E 04	1.9E 05 4.1E 05	3.4E 04 7.5E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.8E 00	1.7E 01 7.7E 00	1.2E 00 5.5E-01	1.1E-02 4.9E-03	5.2E-03 2.4E-03	1.6E-01 KG 6.5E-02 LB
SODIUM FLUORIDE	6.3E 05 1.8E 06	1.4E 06 2.2E 06	1.0E 06 2.2E 06	1.5E 04 KG 3.2E 04 LB	1.0E 01 4.7E 00	1.4E 01 6.3E 00	9.0E-01 4.5E-01	3.2E-03 1.5E-03	1.6E-04 8.0E-05	4.3E-02 KG 1.9E-02 LB
SODIUM HYDRO-SULFIDE	2.8E 04 6.1E 04	1.9E 05 4.1E 05	3.4E 04 7.4E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	2.4E 01 9.1E 00	1.4E 00 6.5E-01	1.1E-02 4.9E-03	5.3E-03 2.4E-03	1.6E-01 KG 6.5E-02 LB
SODIUM HYDROXIDE	1.0E 05 6.1E 05	1.4E 05 4.1E 05	2.2E 05 4.9E 05	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	1.1E-02 4.9E-03	7.9E-04 3.6E-04	1.6E-01 KG 6.5E-02 LB
SODIUM HYPOCHLORITE	5.4E 03 1.3E 04	1.4E 04 4.1E 04	7.4E 03 1.5E 04	2.3E 02 KG 5.2E 02 LB	1.1E 01 4.9E 00	1.4E 01 6.5E 00	1.2E 00 5.6E-01	8.1E-02 3.7E-02	3.3E-02 1.5E-02	1.1E 00 KG 4.9E-01 LB
SODIUM METHYLATE	2.5E 05 5.5E 05	1.8E 05 4.1E 05	3.0E 05 6.9E 05	2.3E 03 KG 5.1E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.7E-01	8.1E-03 3.7E-03	5.9E-04 2.7E-04	1.1E-01 KG 4.9E-02 LB
SODIUM NITRITE	2.1E 04 4.6E 04	1.4E 04 4.1E 04	2.5E 04 5.5E 04	2.3E 02 KG 5.1E 02 LB	1.0E 01 7.1E 00	2.1E 01 9.4E 00	1.5E 00 6.7E-01	1.1E-01 4.9E-02	7.8E-03 3.6E-03	1.4E 00 KG 6.5E-01 LB
SODIUM PHOSPHATE MONOBASIC	2.8E 06 6.4E 06	1.2E 06 2.2E 06	2.4E 06 5.3E 06	1.5E 04 KG 3.2E 04 LB	8.8E 00 4.2E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.8E-03 9.8E-04	7.3E-05 3.3E-05	2.6E-02 KG 1.2E-02 LB
SODIUM PHOSPHATE DIBASIC	1.2E 06 2.4E 06	1.2E 06 2.2E 06	1.4E 06 3.1E 06	1.5E 04 KG 3.2E 04 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.2E-01 4.1E-01	2.8E-03 9.8E-04	1.0E-04 7.4E-05	2.4E-02 KG 1.2E-02 LB
SODIUM PHOSPHATE TRIBASIC	4.2E 05 9.2E 05	1.4E 06 2.2E 06	5.1E 05 1.1E 06	1.5E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	2.8E-03 9.8E-04	3.5E-04 1.6E-04	2.4E-02 KG 1.2E-02 LB
SODIUM SELENITE	1.5E 05 3.4E 05	1.7E 03 3.7E 03	1.8E 05 4.1E 05	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.8E 01 8.2E 00	1.3E 00 5.9E-01	2.1E 00 9.5E-01	9.6E-04 4.4E-04	2.9E 01 KG 1.3E 01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
SODIUM SULFIDE	1.7E 05 3.7E 05	1.0E 05 4.1E 05	2.0E 05 4.5E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 3.2E 00	1.0E 01 3.9E-01	1.3E 00 4.9E-02	1.1E-02 4.9E-03	8.7E-04 3.9E-04	1.0E-01 KG 4.5E-02 LB
STRONTIUM CHROMATE	9.7E 05 1.0E 06	1.0E 06 2.2E 06	6.0E 05 1.5E 06	1.3E 04 KG 3.2E 04 LB	1.0E 01 4.7E 00	1.0E 01 6.2E 00	9.7E-01 4.0E-01	2.7E-03 1.2E-03	1.9E-04 8.6E-05	3.0E-02 KG 1.0E-02 LB
STRYCHNINE	4.7E 03 1.7E 04	1.0E 04 4.1E 04	5.7E 03 1.3E 04	2.3E 02 KG 5.2E 02 LB	1.4E 01 6.3E 00	1.0E 01 6.3E 00	1.3E 00 6.0E-01	1.5E-01 6.8E-02	2.3E-02 1.0E-02	2.0E 00 KG 9.0E-01 LB
STYRENE	1.0E 05 1.7E 05	1.0E 05 4.1E 05	1.7E 05 3.6E 05	2.1E 03 LTR 5.5E 02 GAL	1.2E 01 4.5E 00	1.3E 01 6.0E 00	9.5E-01 4.3E-01	2.7E-03 1.2E-03	6.0E-04 2.7E-04	5.4E-02 LTR 1.4E-01 GAL
SULFURIC ACID	6.0E 05 1.3E 06	1.0E 05 4.1E 05	7.2E 05 1.6E 06	2.3E 03 KG 5.0E 03 LB	9.4E 00 4.3E 00	1.3E 01 5.7E 00	9.0E-01 4.1E-01	1.1E-02 4.9E-03	4.2E-04 1.9E-04	1.0E-01 KG 4.5E-02 LB
SULFUR MONOCHLORIDE	1.1E 04 2.4E 04	1.0E 04 5.1E 04	1.0E 04 5.0E 04	2.3E 02 KG 5.0E 02 LB	9.2E 00 4.1E 00	1.2E 01 5.5E 00	8.6E-01 3.9E-01	8.1E-02 3.7E-02	1.3E-04 6.0E-05	1.1E 00 KG 5.0E-01 LB
2,4,5-T ACID (PURE)	5.9E 02 8.0E 02	1.0E 03 3.7E 03	4.7E 02 1.0E 03	2.3E 01 KG 5.0E 01 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	7.5E-01 1.4E-01	2.7E-01 1.2E-01	1.0E 01 KG 4.7E 00 LB
2,4,5-T ACID (SALTABLE)	3.9E 04 8.0E 04	1.0E 03 3.7E 03	4.7E 04 1.0E 05	2.3E 01 KG 5.0E 01 LB	1.4E 01 6.2E 00	1.0E 01 8.2E 00	1.3E 00 5.9E-01	1.2E 00 5.4E-01	9.0E-03 1.7E-03	1.4E 01 KG 7.4E 00 LB
2,4,5-T ESTERS (PURE)	4.7E 04 1.0E 05	1.0E 05 4.1E 05	5.7E 04 1.3E 05	2.3E 03 KG 5.0E 03 LB	1.1E 01 5.0E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	6.8E-03 3.1E-03	2.3E-03 1.0E-03	9.4E-02 KG 4.1E-02 LB
2,4,5-T ESTERS (SALTABLE)	4.7E 04 1.0E 05	1.0E 05 4.1E 05	5.7E 04 1.3E 05	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.5E-01	1.1E-02 4.9E-03	3.1E-03 1.4E-03	1.4E-01 KG 6.5E-02 LB
TANNIC ACID	1.0E 05 2.3E 05	1.0E 05 4.1E 05	1.2E 05 2.7E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.4E 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.9E-02 8.6E-03	1.9E-03 8.6E-04	2.5E-01 KG 1.1E-01 LB
TDE (PURE)	1.2E 02 2.6E 02	1.7E 03 3.7E 03	1.4E 02 3.1E 02	2.3E 01 KG 5.0E 01 LB	1.0E 01 7.5E 00	2.2E 01 1.0E 01	1.0E 00 7.1E-01	3.7E 00 1.7E 00	1.7E 00 7.6E-01	9.1E 01 KG 2.3E 01 LB
TDE (SALTABLE)	1.2E 02 2.6E 02	1.7E 03 3.7E 03	1.4E 02 3.1E 02	2.3E 01 KG 5.0E 01 LB	1.0E 01 6.4E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	4.8E 00 1.0E 00	2.3E 00 1.0E 00	5.5E 01 KG 2.5E 01 LB
TETRAETHYL LEAD	5.9E 02 1.3E 03	1.7E 03 3.7E 03	6.7E 02 1.5E 03	1.9E 01 LTR 5.0E 00 GAL	1.3E 01 7.2E 00	2.1E 01 9.6E 00	1.5E 00 6.7E-01	1.0E 00 7.5E-01	3.5E-01 1.6E-01	2.3E 01 LTR 8.6E 01 GAL
TETRAETHYL PYROPHOSPHATE	2.3E 03 5.1E 03	1.7E 03 3.7E 03	2.0E 03 6.2E 03	1.9E 01 LTR 5.0E 00 GAL	1.1E 01 6.9E 00	1.4E 01 6.6E 00	1.0E 00 4.7E-01	8.9E-01 4.1E-01	1.1E-01 4.8E-02	1.2E 01 LTR 4.7E 01 GAL

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
TOLUENE	9.2E 04 2.7E 05	1.0E 05 4.1E 05	1.1E 05 2.4E 05	2.1E 03 LTK 5.5E 02 GAL	1.1E 01 4.9E 00	1.4E 01 6.0E 00	1.0E 00 4.7E-01	2.7E-03 1.2E-03	1.2E-03 5.3E-04	3.0E-02 LTK 1.4E-01 GAL
TOXAPHENE (PURE)	1.2E 02 2.6E 02	1.7E 03 3.7E 03	1.5E 02 3.3E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.7E 00	2.0E 01 9.0E 00	1.4E 00 6.4E-01	1.0E 00 7.5E-01	1.0E 00 7.1E-01	2.3E 01 KG 1.0E 01 LB
TOXAPHENE (METTABLE)	1.0E 02 2.0E 02	1.7E 03 3.7E 03	1.5E 02 3.3E 02	2.3E 01 KG 5.0E 01 LB	1.0E 01 8.0E 00	2.3E 01 1.1E 01	1.7E 00 7.6E-01	1.9E 00 8.8E-01	2.2E 00 9.8E-01	2.7E 01 KG 1.2E 01 LB
TRICHLORON	5.7E 05 1.1E 06	1.0E 06 2.2E 06	6.9E 05 1.3E 06	1.9E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.6E 01 7.1E 00	1.1E 00 5.0E-01	3.2E-03 1.5E-03	9.6E-04 2.4E-04	6.3E-02 KG 1.9E-02 LB
TRICHLOROPHENOL	2.6E 02 6.1E 02	1.7E 03 3.7E 03	3.4E 02 7.4E 02	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.9E 00	2.0E 01 9.2E 00	1.4E 00 6.6E-01	7.5E-01 3.4E-01	3.8E+01 1.7E-01	1.8E 01 KG 4.7E 00 LB
TRIETHANOLAMINE DODECYLBENZENE SULFONATE	3.6E 04 7.9E 04	1.8E 05 4.1E 05	4.4E 04 9.6E 04	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.7E 00	1.7E 01 7.6E 00	1.2E 00 5.4E-01	1.1E-02 4.9E-03	4.1E-03 1.8E-03	1.4E-01 KG 4.5E-02 LB
TRIETHYLAMINE	2.7E 05 6.1E 05	1.9E 05 4.1E 05	2.7E 05 5.9E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.8E 01 8.3E 00	1.3E 00 6.0E-01	5.4E-03 2.5E-03	1.1E-03 5.1E-04	7.2E-02 KG 3.3E-02 LB
TRIMETHYLAMINE	1.3E 05 2.9E 05	1.4E 05 4.1E 05	1.4E 05 3.5E 05	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.5E 00	1.6E 01 7.3E 00	1.2E 00 5.2E-01	5.4E-03 2.5E-03	1.6E-03 7.3E-04	7.2E-02 KG 3.3E-02 LB
URANIUM PEROXIDE	3.2E 05 6.8E 05	1.4E 06 2.2E 06	3.6E 05 8.0E 05	1.9E 04 KG 3.2E 04 LB	8.8E 00 4.0E 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	2.7E-03 1.2E-03	3.6E-04 1.6E-04	3.9E-02 KG 1.8E-02 LB
URANYL ACETATE	9.9E 05 1.1E 06	1.7E 06 2.2E 06	4.8E 05 1.3E 06	1.9E 04 KG 3.2E 04 LB	1.2E 01 5.3E 00	1.5E 01 7.0E 00	1.1E 00 5.0E-01	3.2E-03 1.5E-03	2.4E-04 1.3E-04	4.3E-02 KG 1.9E-02 LB
URANYL NITRATE	4.1E 05 9.1E 05	1.0E 06 2.2E 06	5.7E 05 1.1E 06	1.9E 04 KG 3.2E 04 LB	1.2E 01 5.5E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	3.2E-03 1.5E-03	3.3E-04 1.5E-04	8.3E-02 KG 1.9E-02 LB
URANYL SULFATE	3.7E 05 8.3E 05	1.0E 06 2.2E 06	6.5E 05 1.2E 06	1.9E 04 KG 3.2E 04 LB	1.2E 01 5.6E 00	1.6E 01 7.4E 00	1.2E 00 5.3E-01	3.2E-03 1.5E-03	3.6E-04 1.7E-04	8.3E-02 KG 1.9E-02 LB
VANADIUM PENTAFLUORIDE	2.9E 05 6.4E 05	1.7E 06 2.2E 06	3.5E 05 7.7E 05	1.5E 04 KG 3.2E 04 LB	1.1E 01 5.3E 00	1.5E 01 6.7E 00	1.0E 00 4.8E-01	2.7E-03 1.2E-03	3.7E-04 1.7E-04	3.0E-02 KG 1.6E-02 LB
VANADIUM PENTOXIDE	1.5E 05 3.4E 05	1.5E 05 4.1E 05	1.8E 05 4.1E 05	2.3E 03 KG 5.0E 03 LB	1.3E 01 5.9E 00	1.7E 01 7.9E 00	1.2E 00 5.6E-01	1.8E-02 8.8E-03	6.9E-04 4.1E-04	2.3E-01 KG 1.1E-01 LB
VANADYL SULFATE	1.5E 05 3.4E 05	1.0E 05 4.1E 05	1.9E 05 4.1E 05	2.3E 03 KG 5.0E 03 LB	1.3E 01 6.1E 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.8E-02 8.8E-03	6.9E-04 4.1E-04	2.3E-01 KG 1.1E-01 LB

SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY						
					COST OF PREVENTION						
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASUREMENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
VINYL ACETATE	1.0E 05 9.1E 05	1.0E 05 4.1E 05	1.7E 05 3.7E 05	2.1E 03 LTN 5.5E 02 GAL	1.2E 01 2.6E 00	1.6E 01 7.2E 00	1.1E 02 5.2E-01	8.1E-03 3.7E-03	1.5E-03 7.2E-04	1.1E-01 LTN 4.1E-01 GAL	
XYLENE	9.3E 04 1.0E 05	1.0E 05 4.1E 05	1.0E 05 2.2E 05	2.1E 03 LTN 5.5E 02 GAL	9.1E 00 4.1E 00	1.2E 01 5.5E 00	8.7E-01 3.9E-01	5.4E-03 2.5E-03	5.1E-03 2.3E-03	7.2E-02 LTN 2.7E-01 GAL	
XYLENOL	1.0E 05 2.2E 05	1.0E 05 4.1E 05	1.2E 05 2.7E 05	2.1E 03 LTN 5.5E 02 GAL	1.2E 01 5.5E 00	1.0E 01 7.3E 00	1.2E 00 5.2E-01	1.1E-02 4.9E-03	1.5E-03 6.7E-04	1.4E-01 LTN 5.4E-01 GAL	
ZECTRAN (PURE)	3.1E 04 6.8E 04	1.0E 05 4.1E 05	3.0E 04 6.5E 04	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.5E 00	1.0E 01 7.3E 00	1.1E 00 5.2E-01	1.5E-02 6.8E-03	5.4E-03 1.6E-03	2.2E-01 KG 9.1E-02 LB	
ZECTRAN (WETTABLE)	3.1E 04 6.8E 04	1.0E 05 4.1E 05	3.0E 04 6.5E 04	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.7E 00	1.9E 01 8.7E 00	1.0E 00 4.2E-01	1.0E-02 4.8E-03	6.7E-03 2.1E-03	2.3E-01 KG 1.1E-01 LB	
ZINC ACETATE	8.8E 04 2.0E 05	1.0E 05 4.1E 05	1.1E 05 2.4E 05	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.5E 00	1.9E 01 8.6E 00	1.0E 00 4.1E-01	1.0E-02 4.8E-03	5.5E-03 2.6E-03	2.3E-01 KG 1.1E-01 LB	
ZINC AMMONIUM CHLORIDE	7.0E 04 1.5E 05	1.0E 05 4.1E 05	8.7E 04 1.9E 05	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.5E 00	1.9E 01 8.6E 00	1.0E 00 4.1E-01	1.0E-02 4.8E-03	5.5E-03 2.6E-03	2.3E-01 KG 1.1E-01 LB	
ZINC BICHROMATE	1.0E 05 3.7E 05	1.0E 05 4.1E 05	1.0E 05 3.0E 05	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.3E 00	9.0E-01 4.0E-01	1.0E-02 4.8E-03	2.3E-03 1.0E-03	2.3E-01 KG 1.1E-01 LB		
ZINC BORATE	9.3E 04 1.0E 05	1.0E 05 4.1E 05	9.0E 04 1.9E 05	2.3E 03 KG 5.0E 03 LB	1.7E 01 7.6E 00	1.2E 00 5.4E-01	1.5E-02 6.8E-03	1.0E-03 4.6E-04	2.0E-01 KG 9.2E-02 LB		
ZINC BROMIDE	9.2E 04 2.0E 05	1.0E 05 4.1E 05	1.1E 05 2.4E 05	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.5E 00	1.9E 01 8.6E 00	1.0E 00 4.1E-01	1.0E-02 4.8E-03	2.0E-03 1.0E-03	2.3E-01 KG 1.1E-01 LB	
ZINC CARBONATE	5.0E 04 1.1E 05	1.0E 05 4.1E 05	6.0E 04 1.3E 05	2.3E 03 KG 5.0E 03 LB	1.0E 01 4.5E 00	1.9E 01 8.6E 00	1.0E 00 4.1E-01	1.0E-02 4.8E-03	1.5E-03 6.8E-04	2.3E-01 KG 1.1E-01 LB	
ZINC CHLORIDE	5.9E 04 1.3E 05	1.0E 05 4.1E 05	6.7E 04 1.5E 05	2.3E 03 KG 5.0E 03 LB	1.2E 01 5.3E 00	8.6E-01 3.8E-01	1.0E-02 4.8E-03	2.1E-03 9.7E-04	2.0E-01 KG 9.0E-02 LB		
ZINC CYANIDE	4.4E 02 9.6E 02	1.7E 01 3.7E 01	7.7E 02 1.7E 03	2.3E 01 KG 5.0E 01 LB	1.5E 01 6.7E 00	2.2E 01 9.8E 00	1.4E 00 6.4E-01	1.0E-02 4.8E-03	2.3E-01 KG 1.1E-01 LB		
ZINC FLUORIDE	7.2E 04 1.6E 05	1.0E 05 4.1E 05	8.7E 04 1.9E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.2E 00	1.9E 01 8.5E 00	1.3E 00 5.8E-01	1.0E-02 4.8E-03	1.9E-03 8.6E-04	2.3E-01 KG 1.1E-01 LB	
ZINC FORMATE	6.4E 04 1.4E 05	1.0E 05 4.1E 05	7.7E 04 1.7E 05	2.3E 03 KG 5.0E 03 LB	1.4E 01 6.3E 00	1.9E 01 8.7E 00	1.4E 00 6.2E-01	1.0E-02 4.8E-03	2.1E-03 9.7E-04	2.3E-01 KG 1.1E-01 LB	

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SUMMARY OF HARMFUL QUANTITIES AND RATES OF PENALTY FOR COASTAL ZONES

DESIGNATED MATERIAL	HARMFUL QUANTITIES				RATES OF PENALTY					
					COST OF PREVENTION					
	DOHM (KG-LB)	IMCO (KG-LB)	RESOURCE VALUE (KG-LB)	UNIT OF MEASURE-MENT	STATIONARY SOURCE $/KG(LB)	BARGE $/KG(LB)	RAIL $/KG(LB)	IMCO $/KG/LB	RESOURCE VALUE $/KG(LB)	UNIT OF MEASUREMENT $/UNIT
ZINC HYDROSULFITE	4.4E 04 1.0E 05	1.0E 05 4.1E 05	9.7E 04 2.1E 05	2.3E 03 KG 5.2E 03 LB	1.4[illegible] 01 6.4[illegible] 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.8E-02 8.0E-03	1.7E-05 7.7E-06	2.3E-01 KG 1.1E-01 LB
ZINC NITRATE	1.2F 05 2.6E 25	1.0F 05 4.1E 05	1.0E 05 3.2E 05	2.3E 03 KG 5.1E 03 LB	1.4[illegible] 01 6.4[illegible] 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.8E-02 8.2E-03	1.1E-03 5.2E-04	2.3E-01 KG 1.1E-01 LB
ZINC PERMANGANATE	1.7E 05 3.7E 05	1.4F 05 4.1E 05	2.4E 05 4.4E 05	2.3E 03 KG 5.0E 03 LB	1.5[illegible] 01 6.1[illegible] 00	1.9E 01 8.1E 00	1.3E 00 5.8E-01	1.8E-02 8.3E-03	6.2E-04 3.7E-04	2.3E-01 KG 1.1E-01 LB
ZINC PHENOL-SULFONATE	2.2E 05 5.2E 05	1.0E 05 4.1E 05	2.7E 05 6.4E 05	2.3E 03 KG 5.0E 03 LB	1.3[illegible] 01 4.4[illegible] 00	1.8E 01 8.0E 00	1.3E 00 5.7E-01	1.8F-02 8.0E-03	6.1E-04 2.8E-04	2.3E-01 KG 1.1E-01 LB
ZINC PHOSPHIDE	5.4E 04 7.9E 04	1.0E 05 4.1E 05	4.4E 04 9.8E 04	2.3E 03 KG 5.2E 03 LB	1.3[illegible] 01 4.1[illegible] 00	1.8E 01 8.1E 00	1.3E 00 5.8E-01	1.5E-02 6.8E-03	3.8E-03 1.5E-03	2.4E-01 KG 9.4E-02 LB
ZINC POTASSIUM CHROMATE	1.5E 05 3.4E 05	1.4E 05 4.1E 05	1.4E 05 4.1E 05	2.3E 03 KG 5.2E 03 LB	1.2[illegible] 01 5.4[illegible] 00	1.6E 01 7.2E 00	1.1E 00 5.1E-01	1.5E-02 6.8E-03	7.8F-04 3.2E-04	2.4E-01 KG 9.8E-02 LB
ZINC PROPIONATE	8.4E 04 1.9E 05	1.4E 05 4.1E 05	1.0E 05 2.3E 05	2.3E 03 KG 5.2E 03 LB	1.4[illegible] 01 6.4[illegible] 00	1.9E 01 8.5E 00	1.3E 00 6.1E-01	1.9E-02 8.0E-03	1.6E-03 7.2E-04	2.3E-01 KG 1.1E-01 LB
ZINC SILICOFLUORIDE	1.3E 05 2.9E 05	1.0E 05 4.1E 05	1.5E 05 3.4E 05	2.3E 03 KG 5.2E 03 LB	1.4[illegible] 01 6.2[illegible] 00	1.8E 01 7.3E 00	1.3E 00 5.9E-01	1.8E-02 8.0E-03	1.1E-03 4.9E-04	2.3E-01 KG 1.1E-01 LB
ZINC SULFATE	1.2E 05 2.6E 05	1.0E 05 4.1E 05	1.0E 05 5.1E 05	2.3E 03 KG 5.0E 03 LB	1.4[illegible] 01 6.5[illegible] 00	1.9E 01 8.6E 00	1.4F 00 6.1E-01	1.8E-02 8.0E-03	1.2F-03 5.3E-04	2.3E-01 KG 1.1E-01 LB
ZIRCONIUM ACETATE	4.5E 05 1.0E 06	1.0E 06 2.4E 06	1.0E 06 2.3E 06	1.5E 04 KG 3.2E 04 LB	1.0[illegible] 01 4.7[illegible] 00	1.4E 01 6.3E 00	9.8E-01 4.5E-01	3.2E-03 1.5E-03	1.6E-04 7.3E-05	4.3E-02 KG 1.9E-02 LB
ZIRCONIUM NITRATE	1.5E 06 3.3E 06	1.4E 06 2.2E 06	1.8E 06 4.0E 06	1.5E 04 KG 3.2E 04 LB	8.8[illegible] 00 4.0[illegible] 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	3.2E-03 1.5E-03	9.1E-05 4.1E-05	4.3E-02 KG 1.9E-02 LB
ZIRCONIUM OXY-CHLORIDE	2.7E 06 5.9E 06	1.4E 06 2.2E 06	1.2E 06 7.1E 06	1.5E 04 KG 3.2F 04 LB	8.8[illegible] 00 4.0[illegible] 00	1.2E 01 5.3E 00	8.4E-01 3.8F-01	3.2E-03 1.5F-03	5.1E-05 2.3E-05	4.3E-02 KG 1.9F-02 LB
ZIRCONIUM POTASSIUM FLUORIDE	7.9E 05 1.7E 06	1.4E 05 4.1E 05	9.5E 05 2.1E 06	2.3F 03 KG 5.2E 03 LB	1.4[illegible] 01 6.4[illegible] 00	1.4E 01 6.4E 00	1.0E 00 4.5E-01	1.8F-02 8.0E-03	1.7E-04 7.9E-05	2.3E-01 KG 1.1E-01 LB
ZIRCONIUM SULFATE	1.2E 06 2.7E 06	1.2E 06 2.2E 06	1.5E 06 5.3E 06	1.5E 04 KG 3.2E 04 LB	9.2[illegible] 00 4.2[illegible] 00	1.2E 01 5.5E 00	8.7E-01 4.0E-01	3.2E-03 1.5E-03	1.1E-04 5.0E-05	4.3E-02 KG 1.9E-02 LB
ZIRCONIUM TETRA-CHLORIDE	1.9E 06 4.1E 06	1.4E 05 4.1E 05	2.3E 06 5.0E 06	2.3E 03 KG 5.0E 03 LB	8.8[illegible] 00 4.0[illegible] 00	1.2E 01 5.3E 00	8.4E-01 3.8E-01	1.8E-02 8.0E-03	7.3E-05 3.3E-05	2.3E-01 KG 1.1E-01 LB

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APPENDIX O

GLOSSARY

ADJUSTMENT FACTOR (AF) - In the IMCO Methodology, a factor ranging between 0 and 1 which is applied to the base rate of penalty in order to compensate for certain mitigating properties of the various hazardous materials. This factor was necessitated by the "worst case" approach used to derive the base rate of penalty in this methodology.

ADJUSTMENT FACTOR (rk) - A factor which incorporates the characteristics of a hazardous material (toxicity, solubility, dispersal) into a mathematical form to utilize in adjusting the penalty rate.

ANNUITY - An annual payment or income.

ANNUITY FACTOR (Anf) - Adjustment factor employed in the Resource Value Methodology to account for differences in persistence characteristics between the designated hazardous substances.

ANNUALIZED CAPITAL COST - Capital costs converted into equivalent uniform annual figures based upon an expected life for the equipment and a stated interest rate.

APPLICATION FACTOR - An adjustment factor utilized to adjust the plug flow model in order to recognize the potential for spills to be concentrated in plugs requiring less than 96 hours to pass a point.

BASE RATE OF PENALTY - As used in the IMCO Methodology, this term refers to a rate of penalty derived from a "worst case" approach. In the Resource Value Methodology, the base rate of penalty results from application of the intrinsic components for the dollar ranking factor to the rate of penalty.

BODY CONTACT ACTIVITIES - Swimming, boating, and beach activities which include contact with natural waters.

CFR - Code of Federal Regulations

CIVIL PENALTY - A regulated fining mechanism intended to discourage undesired actions by providing negative economic incentive.

COMPLETE MIXING - All constituents of a water body uniformly mixed.

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CONTIGUOUS ZONE - The entire zone defined as contiguous under Article 24 of the Convention on the Territorial Sea and Contiguous Zone.

COST OF PREVENTION - Cost of installing and maintaining equipment for the sole purpose of preventing the spill of material.

CRIMINAL PENALTY - A regulated fining mechanism intended to carry punitive consequences in addition to a negative economic incentive for undesirable actions.

CRITICAL CONCENTRATION - For a given hazardous material, the concentration (in water) at which substantial harm is expected to occur.

CRITICAL VOLUME - The volume associated with the threshold of substantial harm for a given methodology. The critical volume for a water body will be that volume of water brought to the critical concentration if a harmful quantity is spilled.

DECISION TREE ANALYSIS - A method for weighing the consequences of mutually exclusive decisions based on the probability of related outcomes.

DELPHI - A procedure for obtaining a consensus of opinion through systematic repeated questioning of participants in an environment which controls confrontation between the participants.

DESIGNATED HAZARDOUS SUBSTANCES - Specific hazardous substances enumerated in pending federal regulations to comply with the mandate in Section 311 of Public Law 92-500.

DIRECT EFFECTS - Effects noted directly in the target species of interest.

DISP - Dispersal component employed as an intrinsic factor in the Resource Value Methodology to account for differences in the ability of a material to spread in the environment as a result of its specific gravity, solubility, and volatility.

DOHM - Division of Oil and Hazardous Materials, U.S. Environmental Protection Agency.

DOHM METHODOLOGY - An approach to setting harmful quantities based on the use of a plug flow model operated with a statistically derived stream flow rate.

EC_{50} - Median effective concentration. The concentration at which the effect of interest is noted in 50 percent of the test sample.

ECONOMIC THRESHOLD - Dollar value level which when exceeded represents a substantial economic amount, i.e., damage with a monetary value in excess of the economic threshold is considered substantial.

EXTRINSIC PROPERTIES - Properties whose values depend upon the nature of external events or circumstances.

FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972 - Public Law 92-500.

FINAL RATE OF PENALTY - Rate of penalty assigned in the Resource Value Methodology after application of extrinsic components in the dollar ranking factor to the base rate of penalty.

FISH KILL - The observation of dead fish in normally habitable waters.

FLOW DURATION CURVE - A plot of stream discharge versus frequency (the percent of a year which the discharge is equaled or exceeded).

GESAMP - An acronym for the Joint Group of Experts on the Scientific Aspects of Marine Pollution. GESAMP is composed of experts from a number of international organizations and serves in an advisory capacity in the area of marine pollution.

HARMFUL QUANTITY - Relative to hazardous materials, "those quantities, the discharge of which, at such times, locations, circumstances, and conditions, will be harmful to the public health or welfare of the United States, including, but not limited to fish, shellfish, wildlife, and public and private property, shorelines and beaches . . ." (Sec. 311).

HAZARD CATEGORY - In the IMCO Methodology, one of the four categories (A through D) to which a hazardous material can be assigned on the basis of the degree to which it is expected to exert its various hazard potentials in a spill situation.

HAZARDOUS MATERIAL (SUBSTANCE) - As defined in Section 311, such elements and compounds (other than oil) "which, when discharged in any quantity into or upon the navigable waters of the United States or adjoining shorelines on the waters of the contiguous zone, present an imminent and substantial danger to the public health or welfare, including, but not limited to fish, shellfish, wildlife, shorelines, and beaches."

HAZARD POTENTIAL - In the IMCO methodology, this term refers to any one of the five identified hazards which can be presented by a hazardous material.

HYDRAULIC RATING CURVE - A curve of river discharge versus the water's physical characteristics (velocity, depth, width, and cross-sectional area).

IMCO - An acronym for the International Maritime Consultative Organization, a depository of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954. Its purpose is the formulation of international agreements to prevent and control pollution of the sea.

IMCO METHODOLOGY - The name assigned to the second methodology developed in this report. This methodology is based on a hazardous material rating/classification proposed by the 1973 International Convention on Marine Pollution as part of their regulations for the control of pollution by noxious substances transported in bulk.

IMPACT DURATION - Period during which the receiving water continues to show the effects of a spill. This includes both the acute effects period, and the period of re-population.

INCIPIENT TIME THRESHOLD - Minimum time required to observe death in aquatic organisms exposed to high levels of a toxic material. The value is derived graphically as the asymptote on the time-dose mortality relation at high contaminant concentrations.

INCIPIENT TOXICITY THRESHOLD - Concentrations just toxic to aquatic organisms over infinite exposure time. On the time-dose mortality relation, the asymptote approached at infinite time.

INDIRECT EFFECTS - Effects borne by segments of the ecosystem not of direct interest, the ramifications of which in turn affect the target species of interest, e.g., the destruction of an important fish food organism which subsequently causes depletion in the population of the receptor of interest.

INDUCED EFFECTS - Effects which occur as a result of introduction of one agent which activates the potential of other agents already present in the water, e.g., synergism between natural constituents in the water and a spilled material.

INSTANTANEOUS MIXING - Dispersion and diffusion of a substance immediately upon its entrance into a water body.

INTRINSIC PROPERTIES - Properties whose values result from the nature of the material itself.

LITTORAL DRIFT - A beach and longshore drift resulting from a combination of onshore wind and oblique wave fronts.

LOCATIONAL DISPERSION FACTOR (LOC) - Extrinsic factor employed in the Resource Value Methodology to adjust for differences between the receiving waters' actual capacity to disperse a spill and the instant mixing assumption utilized in establishing the base rate of penalty.

MARGINAL VALUE - The value of one additional unit.

MEDIAN RECEPTOR - An aquatic organism which has shown a median sensitivity to various hazardous material concentrations.

PLUG FLOW MODEL - A simplified model which assures that material spilled into a water body instantaneously mixes to a uniform concentration with a definite leading and trailing edge and that the contaminated volume of water moves uniformly downstream (in the case of a river).

PRESENT WORTH - The value today based on all future payments as adjusted according to the prevailing interest rate assuming that the interest rate remains constant.

RATE OF PENALTY - For a given hazardous material, a ratio of dollars per unit mass of hazardous material which when multiplied by the mass of hazardous material spilled, results in a penalty assessable to the spiller.

RECREATION DAY - A user day dedicated to recreational pursuits.

REDUCTION IN AMENITIES - Refers to loss or decrease in value for recreational use or scenic aspects.

RESOURCE USE MODIFIER (ResU) - Extrinsic factor employed in Resource Value Methodology to adjust rates of penalty to account for deviations between the actual recreational value of the receiving waters and the average value employed to establish the base rate of penalty.

RESOURCE VALUE METHODOLOGY (RVM) - An approach to setting rates of penalty and harmful quantities based on equating penalties to the value of damages sustained by the environment. Harmful quantities are defined as those capable of causing damage in excess of a threshold dollar value.

SALT WATER WEDGE - A saline mass of water which has a distinct salt gradient between itself and the overlying waters. Normally formed during periods of high runoff in estuaries.

SCATTER DIAGRAM - Graphical plot of points characterized by two individual parameters in an attempt to define a relationship between the parameters.

STATIONARY SOURCE - A fixed location which potentially will discharge or spill a hazardous material (i.e., industrial plant site, tank farm, municipal storage facility).

TIDAL EXCHANGE - Amount of water which leaves the estuary during an ebb tide and is not returned during the following flood tide.

TIDAL PRISM - Amount of estuarine water represented by the volume of water existing between the mean high water (MHW) and the mean low water (MLW) level.

TIME-DOSE MORTALITY RELATION - Relation established by plotting the TLm concentration against the time of exposure.

TIME OF PASSAGE - The time required for a plug flow of water to pass a point.

TL_m - (Median Tolerance Limit) For a given material, the concentration which produces a given effect in 50 percent of the sample population during a specified time period.

TYPE III BARGE - A barge designed to carry products of sufficient hazard to require moderate degree of control (sulfuric acid, etc.). Each barge must meet certain specific standards of water tight subdivision, structural hull strength, and tank arrangement to protect the cargo.

UNIT OF MEASUREMENT METHODOLOGY (UM) - An approach based on selection of units of measurement common to the transportation of hazardous materials as the harmful quantity. The rate of penalty is scaled between $100 and $1000 per unit of measurement on the basis of physical-chemical properties.

USER DAY - A visit to given site by a single individual for a period not exceeding a single calendar day.

VARIANCE - Deviation from expected values. In statistics, variance is defined as a square of the standard deviation, but the term is used in a more general sense here.

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